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THE SHOE SEASON AND ITS PRICES.

THE price-lists, discounts, contract blanks, and catalogues of the rubber boot- and shoe-manufacturers for the season of 1894–95 are out and are attracting the usual amount of attention. The lists of the companies that comprise the United States Rubber Co. and the list of the Boston Rubber Shoe Co. are practically the same, so that there will be this year, as last, harmony in selling. There is but little change from last year's prices, the most important being the drop in the list price of men's short boots of 25 cents and in boys' short boots of 10 cents. "Specialties," or light goods that are packed in cartons, which last year appeared on the list at 10 cents higher than goods packed in bulk, have been reduced 5 cents, this to affect all but such as fasten with buckles or buttons.

Retailers will receive the same discounts as last year, that is, 20 per cent. on "firsts," 20 @ 12 per cent. on "seconds," and 20 @ 12 @ 12 per cent. on "thirds." In order to give the jobber a chance to book early orders, and thus distribute the business through the season a little more evenly, a concession of 5 per cent. in the shape of an extra discount is given to all retailers who order and receive goods between April 1 and September 30, 1894, but no such discount is given for goods shipped between October 1, 1894, and March 31, 1895. On all deliveries between April 1 and October 31, 1894, bills are to be dated November 1—thirty days. November and December deliveries date thirty days from shipment. January, February, and March (1895) deliveries date April 1, 1895—thirty days. Eight per cent. per annum is allowed for prepayment on goods delivered prior to November 1, 1894. If all goods delivered in November are paid for by the retailer on or before December 10, he may receive a cash discount of 1 per cent., and the same applies to December receipts that are paid for before January 10, 1895. For deliveries during January, February, and March, 1895, the retailer has the option of a discount at the rate of 8 per cent. per annum if paid prior to April 1, or 1 per cent. off if paid between April 1 and 10.

Actual freight is allowed from any point within the territory located east of the western boundary of Montana, Wyoming, Utah, and Arizona, to any point located within the same territory, but no freight is allowed to any point outside of it.

The encouragement given to retailers to purchase in cartons rather than in bulk is most wise. There is no doubt that rubber shoes keep their shape better, wear longer, and are far less sensitive to the oxydizing effects of dry air and light, when put up this way, and in the long run the manufacturer will reap the benefit of it.

Another change, and one that shows the best of generalship, is the decision to brand all "thirds" as "thirds." The best of rubber shoes have long been injured by the failure of the poorer grades to do good service. To most purchasers a rubber shoe is a rubber shoe, and a "third" is as good as a "first" when branded with a high-sounding name. But stamp it *third quality*, and the man who buys it will not lay its sins upon the better-grade goods.

Nor can the retailer as easily palm off third-quality goods as firsts, which has many times been done in the past. In thus protecting the customer against his own lack of knowledge, and also against the rapacity of unscrupulous dealers, the management of the United States Rubber Co. have shown themselves exceedingly progressive, as they have also in reducing the prices on goods just as soon as circumstances warranted it.

SOME POINTS IN THE RUBBER SITUATION.

IT will be seen from our compendium of statistics this month that for some time past the imports of crude rubber into the United States, and also our exports of rubber manufactures, have been considerably smaller than during a corresponding period one year ago. There is nothing discouraging in this showing, when it is considered that the comparison is made with the largest movement for any year in the history of the country. It may be said, on the other hand, that the imports of crude rubber and the exports of manufactured goods have been larger during the last eight months than the average for the same period during five years past. It cannot be expected that every year will show the largest figures on record, and the present year, with respect to rubber, is showing only such a decrease as is apparent in nearly every other branch of our importing and exporting trade.

There is nowhere any indication of a falling-off in the production of rubber. On the contrary, there are in many localities rubber-gatherers making shipments which the most expert statistician cannot keep in touch with. This is particularly true of the product of central Africa, which, by reference to other figures on our statistical page, will be found to be producing more rubber than any authority on the subject has reported in the past. Estimating the world's consumption of rubber for last year at 70,000,000 pounds or upwards—and this is not too liberal an estimate—and deducting from this the rubber produced in American countries, it will be seen that a very heavy supply remains unaccounted for unless it should have been received from Africa. The statistics for Brazil and neighboring countries have become so well systematized that the estimates from that quarter are pretty nearly accurate. On the other hand, there are no statistics of rubber-production recorded in Africa, and all that can be learned of the output of that continent is by tracing the imports from there by the leading rubber-consuming countries.

It will be found in the end that the South American production, outside the district tributary to the port of Pará, is of no slight importance. For instance, how many American readers are familiar with the name of Fortaleza, the capital city and the principal shipping-port of the state of Ceará, a little south of the Amazon, on the Atlantic coast? Yet the imports of rubber from that point, since custom-house records began to be kept (in 1846), have amounted to nearly 5,000,000 pounds. The rate of the output from Ceará has been variable, but at present it is attaining good proportions, and the enterprise shown by the government of this state in advertising its resources at the World's Columbian Exposition gives an indication that the development of these resources, including the exportation of rubber, is likely to be largely increased in the near future.

In an early issue of this journal will be presented a comprehensive article on the rubber-production of the states of Pará and Amazonas, which will indicate that, if any alarm has been felt in any part of the world over the possible extinction of the supply of rubber from Brazil, this alarm has appeared some two hundred years too soon. The prevailing prices of rubber throughout the world go to support our position that there is no danger either of a falling-off in the supplies of this commodity or of permanent enhancement in price at any time within our existence. There ought to be some comfort at least in the thought that when business does improve there will be no lack of rubber.

IF.

IF only *I* were president
Of the U. S. Rubber Co.,
I'd bring to bear a policy
To make the business grow.

A billion nipples I would ship
To stick on rubber-trees,
And make the natives milk each day,
Instead of when they please.

I'd build a monstrous washing-plant
At Manáos or Pará,
And ship clean rubber to my mills
From South Americá.

Then England's chalk-cliffs I would buy;
The lead-mines of Nevada;
Ancient Vesuvius I'd bribe
To spout up sulphur harder.

I'd help keep up the "acid suits";
Keep Mitchell still declaiming;
Extract the acid from his talk,
And use it in reclaiming.

I'd build a mammoth cotton-mill
Right on the "Alice" roof,
And make my sheetings all complete,
And dye them, warp and woof.

I'd buy a great big tube machine,
Either from Clark or Royle;
Instead of hand-made boot-legs, this
Would squirt them by the mile.

I'd buy a twelve-roll calender,
From Birmingham or Farrel,
To take in sheeting by the rood,
And rubber by the barrel.

The cloth and rubber I would feed
Into the upper part,
And turn out cords of rubber shoes
All finished from the start.

If I were Mr. Banigan,
All this and more I'd do;
And then off fishing I would go,
With Walter S. Ballou.

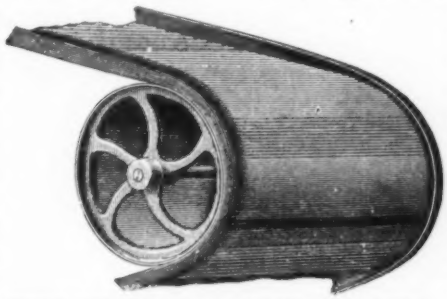
RUBBER BELTS FOR ORE-CONCENTRATION IN MINING.

By Albert Williams, Jr., Mining Engineer, Denver.

MACHINES known as "belt vanners" or "belt concentrators" are now used very extensively in the concentration of ores in connection with mining. They are employed in that class of work called fine concentration,—that is, where the ore to be treated has been pulverized to a very fine state in order to free the smallest particles of valuable mineral in the raw ore from the worthless portion, or "gangue." The material treated by these machines should be at least as fine as that which will pass through a screen of thirty meshes to the linear inch (900 holes per square inch), though a finer degree of pulverization is generally adopted, a 40 mesh screen being the favorite size. Of course a large part of the particles passing through a screen of a given mesh are very much finer than the maximum size that will just go through, down to the most impalpable mud or "slime." The crushing is most commonly done by stamps, though also by other pulverizing apparatus which will give a fine product. Belt vanners are not adapted to coarse concentration, in which the object is to handle large quantities rapidly and cheaply, as in the case of iron-ores, lead- and zinc-ores not containing gold or silver, and similar substances. They would also be out of place in such rough work as placer-mining, where the whole of the material would have to be handled, or even after the large stones and pebbles had been screened off; but they might be used for final concentrating of the black sands caught in the "undercurrents" of placer-sluice lines.

RUBBER CONCENTRATOR BELT, IN NARROW SECTIONS, WITH FLUTED FLANGES.

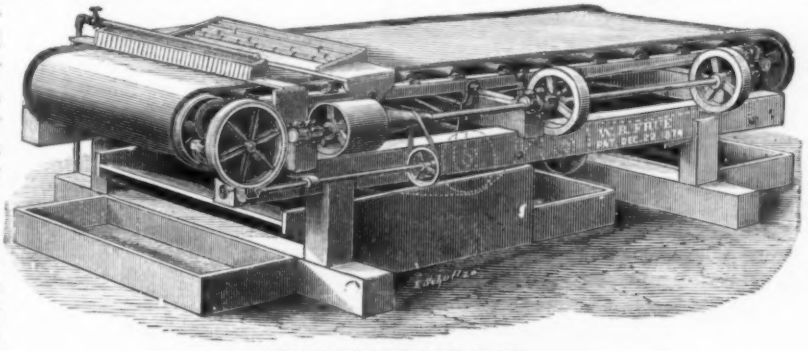
Owing to the comparatively high first cost of these belt machines and their relatively small capacity, they are used only on ores which, though rather low grade in the crude state, furnish a highly valuable concentrate. Their particular field is in treating ores containing gold and silver. Gold-ores generally do not yield all their precious contents to a simple amalgamation process, as part of the gold is locked up in combination with sulphur, arsenic, iron, copper, zinc, etc., in the form of various base minerals. Belt vanners save these refractory minerals as concentrates, which are then treated by methods too expensive to apply to the ore in bulk. The silver-ores concentrated are those of medium or low grade in which the silver is associated with lead, copper, zinc, etc. Vanners are also used in working tailings from amalgamating mills, tailings from pans, and settlers in silver-mills, the crushed ore ("pulp") direct from stamps and other pulverizing machines, and for the tailings from jigs in concentration-works for copper- and lead-ores, saving the finer particles that escape the jigs.



RUBBER CONCENTRATOR WITH INTERMITTENT CORRUGATIONS.

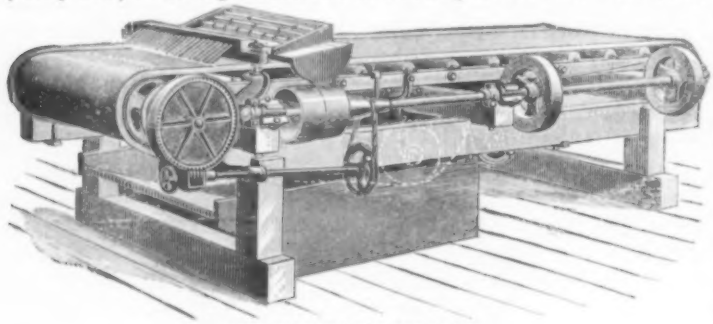
The object of concentration is not to produce a final product, but to reduce the bulk of the material to a small amount—one-fifth, one-tenth, one-twentieth, or less, as the case may be—so that it can stand the cost of transportation to a smelter, and also to put it in such form that it can be profitably treated, whether on the spot or at a distant works. Thus ore worth only $10 a ton or less can sometimes be converted into a highly valuable concentrate, and some gold ores worth only $2 to $3 are concentrated in connection with the amalgamation process. Gold-sulphuret concentrates are worth, as a rule, from $30 to $100 or $200 per ton.

A belt vanner or concentrator is a machine having an endless traveling inclined rubber belt supported by rollers so as to form at the top an inclined surface. The slope is very gentle, an inch or so. This top surface is usually 12 feet long and from 4 to 6 feet wide, but more commonly of the former width. The belt has upturned rubber flanges at the edges to prevent the escape of pulp and water over



BELT VANNER WITH SIDE SHAKE.

the sides. It travels slowly up the incline over the head drum, and around a lower drum which dips slightly into a water-tank, where the concentrates are collected; thence up over the foot drum, and so on. The fine pulp and water are supplied near the head of the machine. Water-jets or (rarely now) revolving brushes aid in cleaning off the concentrates below. The water passes off at the foot into a tailings launder. The feed of pulp and water is carefully regulated by distributing devices of great ingenuity.

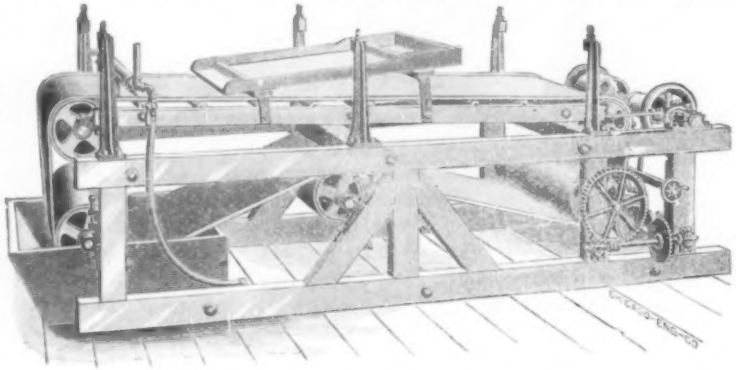


BELT VANNER WITH SIDE SHAKE.

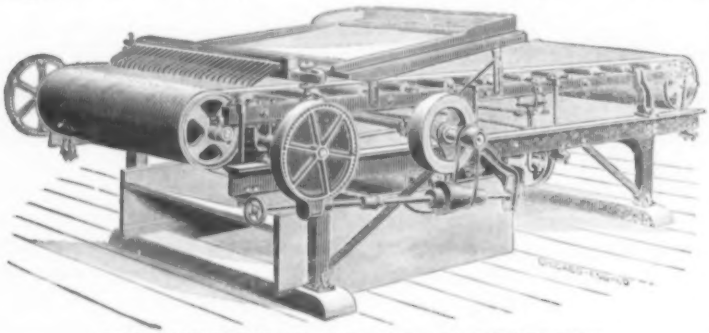
The idea of the endless traveling belt for ore-concentration is quite old, but was never put into very successful application until an additional movement or "shake" was given to it in addition to the upward travel. All the modern machines have this secondary movement, which is either sideways or endways, of small extent ("throw") and quite rapid. The effect is to jar the pulp carried on the belt, in such a way as to separate ore and gangue particles quickly, the former settling on the belt on account of their heavier weight, traveling up over the head drum and down into the collecting tank; while the lighter sand and worthless material, meeting the streams from the water-jets, are washed off at the foot.

The moving part of the machine is swung in its own separate frame from the fixed frame, and the auxiliary motion is given by a special crank-shaft along one side or at one end, according as the machine is of the "side-shake" or the "end-shake" class.

Besides the construction and motion of these belt concentrators, the material and form of the belt itself are most important and vital factors. It is only about twenty years ago that the belt vanners began to be really successful machines, and it is largely to the high perfection to which the manufacture of the rubber belts has been brought since that time the success is due. Rubber is not only adapted to the very trying service to which it is thus subjected by the short bends, the welting and drying, the wear from the sharp mineral particles, etc., all of which causes would rapidly ruin any other material; but its peculiar texture is found to be just right for securing the adherence of the finest ore particles. A union of so many desirable qualities in one material is something to be wondered at. It must be remembered that these belts are used at places remote from the point of manufacture and far from works where they could be repaired; that they are exposed to great extremes of temperature, from that of the climate of Alaska to that of the tropics, and varying in our own mountains very greatly from season to season and from night to day; that, although normally wet, they may at times be idle in a climate of intense aridity. In small works it is not usual to keep any spare belts on hand, and in large ones only one or two at most. At the same time it is necessary that they should be of such quality that they may be relied on for durability and efficiency, for a failure in them would mean a serious and costly delay. While very small patching can be done with rubber cement, serious repairs cannot be made at the mines. From all these and other reasons it will be understood that the manufacturer has to supply goods of high excellence, and that the user will not care to have the first cost cut down a little, if that is to be accomplished at any sacrifice in quality.



BELT CONCENTRATOR WITH END SHAKE—WOODEN FRAME.



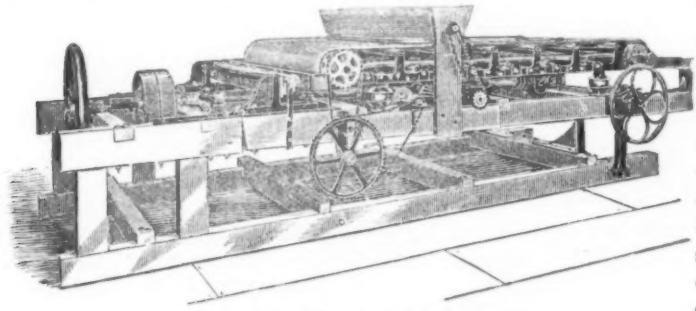
BELT CONCENTRATOR WITH END SHAKE—WROUGHT-IRON FRAME.

It is impossible to say what is the average life of a rubber concentrator-belt, as conditions vary so widely. They certainly last a long time if carefully used—often five years or more in continuous service. One manufacturer of concentrators who has been supplying machines for many years said that he had never been called on to replace a belt, and rather quizzically complained of the rubber-mills from which he got his belts, because they turned out so good an article that he had no chance to make com-

missions on selling new belts to go on old machines. "They are spoiling their own trade by their stupidity," he said. But he didn't mean it.

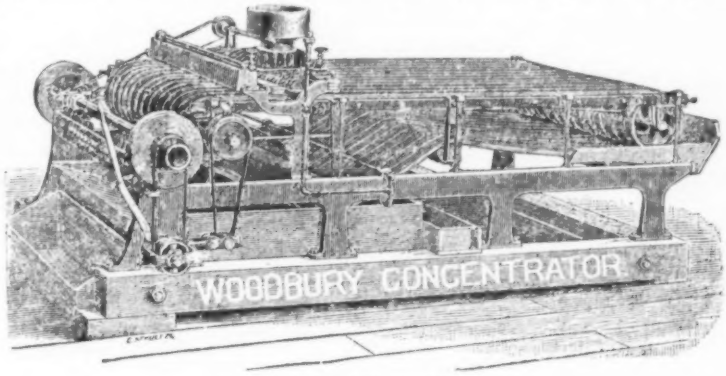
The standard-size belt is 4 feet wide and long enough to give a 12-foot "table" or top surface and allow for the bends over the end drums and the U-shaped angle into the collecting tank—say 28 or 29 feet in all. Such belts cost (list) about $125 each, whether plain or corrugated. Solid belts are also made in 5-foot and 6 foot widths, with about the same length.

The belts are usually 5 ply, and very carefully made. There has to be an upturned edge or flange, and much ingenuity has been exercised in providing this flange. It is a separate strip of pure rubber, which is affixed to the body of the belt and treated with it as a unit in vulcanizing. It stands about an inch higher above the belt. Now evidently the flange, in passing over the rollers, has to stretch considerably more (say an inch to the foot) at its upper edge than does the lower part where it adjoins the body of the belt. So not only are special devices required for affixing the flange strip very securely to the body (for which there are several patents), but an allowance has to be made for the unequal strains and stretching. One device is to bend the flange over at an angle toward the center of the belt; thus the part first passing over one of the drums has a surplus which can be utilized as it temporarily straightens up to a right angle. Another plan successfully adopted is to give the flange a continuous waved or fluted shape, for the purpose of elongating the edge at the top and gradually diminishing toward the main part of the belt. This improvement prevents the edges from cracking, as they have only to straighten out and not stretch as they pass around the drums, as plain edges have to do, and which continuous stretching and relaxing are very trying to the rubber.



A NEW FORM OF ORE-CONCENTRATOR.

What is called a "plain" belt has a surface about like that of an ordinary rubber driving belt, or perhaps there is a slightly more perceptible "grain," which can just be felt by the finger, which soon wears absolutely smooth. It was long ago proposed to increase the concentrating effect by giving the belt surface a series of fine transverse corrugations, intended to act, on the small scale, in the same manner that "riffles" do in regular mill- and placer-sluices. For many years there have been these two styles on the market, to suit the taste of the user, and the corrugated belts have been supplied at the same price as the plain ones. There is considerable difference of opinion among metallurgists as to which is the best surface for any particular duty. Some mining men, indeed, prefer the plain



THE WOODBURY ORE-CONCENTRATOR.

smooth surface for all work. Others claim a closer saving of fine slimes with the corrugated style. Whatever advantage the latter has is at least partially offset by the tendency of the fine material to clog up the small grooves, and this requires more water to be used in the jets which wash off the belt at the receiving-tank. The corrugations, too, lose their sharpness by wear. They are about one-thirty-second of an inch deep and ruled closely together.

Lately a combination of plain and corrugated surfaces has been introduced. The principal area of the belt is left smooth, while at intervals of from two to four feet a transverse band (about 3 inches wide), having a very slight riffled surface, is introduced. These corrugations are designed to catch the very fine sulphurets and quicksilver or amalgam that might otherwise escape with the tailings from a very smooth belt.

Still another style of surfacing is to alternate transverse bands of fine corrugations over a space of 3 inches with other 3-inch bands having longitudinal corrugations (running lengthwise with the belt), none of the surface being left smooth.

In order to increase the capacity of a belt vanning machine the belt is made as wide as possible consistent with good working. Here a difficulty comes in, for if too much pulp is run on the belt, the pulp will seek a channel for itself instead of spreading out evenly, and make a rapid current either on one side or the other if the machine is out of level, or down the center of the belt, if the machine happens to be level transversely. This tendency of the pulp to bank up and run irregularly limits the capacity of a concentrator. To obviate the difficulty a recent concentrator (now about three years old) is constructed to carry a series of narrow belts, joined together side by side. Each of these sections is 8 inches wide, and as there are seven units in the set making up the composite belt, the total width, allowing for a slight gain between each pair of narrow belts, is about 5 feet. Each narrow belt

in the set has its own independent edge-flanges, which, with this machine, are of the fluted style. This arrangement is claimed to add greatly to the capacity of a single machine, which is said to handle 12 to 15 tons of ore in twenty four hours. The weight of each of the narrow belts is 29 pounds, or 203 pounds for the set. A solid belt of the same width is somewhat lighter. The weight of the whole machine, except bed timbers, is 2336 pounds. The narrow belts, like the wide ones, are made with plain surface, or with alternate transverse and longitudinal corrugations in bands each 3 inches wide.

The prices for the various makes of belt concentrators, of which there are many styles on the market, range from $350 upward. The standard form, with a capacity of 5 to 12 tons in twenty-four hours, and weighing about 2100 pounds, sells for $575 f. o. b. Larger machines are listed at $800 each.

Belt concentrators give only one grade of product, but that in a very good shape for further treatment. Their advantages are that the concentration may be made very close and the product clean, without much loss in the tailings; that they take the raw material direct from the stamp batteries or other pulverizing machinery without the need of intervening sizing or classifying apparatus; and that they use little water. The percentage saved in the concentrators sometimes runs over 95 per cent. of the actual contents of the crude ore, if that lends itself readily to concentration. Any fine material that can be concentrated at all can be concentrated by the belts, but these would be adopted only when the value of the results warrants the use of expensive machinery working at rather low capacity. The belt machines, once adjusted, require very little attention, one man per shift taking care of a dozen to twenty machines.

The amount of water used by a side-shake, 4-foot machine is as follows: water in pulp, 9 to 22 pounds, or say 1 to 3 gallons per minute; clear water, 6 to 16 pounds, or say ¾ to 2 gallons; total, 16 to 32 pounds, or say 2 to 4 gallons per minute. Taking an average of, say, 3 gallons per minute for total water,—*i. e.*, both pulp and clear water and machines treating only 6 tons per day,—it would require ½ gallon per minute for each ton crushed and concentrated per twenty-four hours. This relatively small amount of water used is one of the chief advantages of the belt vanners, for concentrating machinery often has to be operated in places where water is very scarce.

The belt concentrators have a capacity of from 5 to 12 and 16 tons of crude material each per twenty-four hours, according to the size of machine and the speed with which it is run. The latter will depend upon the character of the material handled; that is, whether it is difficult to concentrate and whether it is worth while to attempt a very close concentration, or, in other words, according to the value of the product. The adjustment for speed can be made with great delicacy and precision, by regulating the grade, throw, and speed of shake, speed of travel, quantity of pulp allowed to pass over the belt, and especially by changing the amount of clear water used in the jets. The power required for each machine averages about one-fifth of 1 horse-power, though there are some machines that require more and some which are claimed to run at less expense of power. The rubber belts used for concentration are all made in the United States, where much attention has been given to this specialty. No works making these vanner belts are known abroad, as the belt system of concentration is entirely of American invention and development.

The business of manufacturing concentrator belts has grown to large proportions. There are many hundreds of belt concentrating machines now in constant use, not only in this country, but in Canada, Mexico, Central America, South America, Australia, South Africa, etc. A single gold-mill in Alaska has forty-eight belt vanners, while there are many mills which have from twenty to thirty each. As the belts cost over $100 each, the value of the total output of this branch of the mechanical rubber-goods industry must be already many hundreds of thousands of dollars. Its activity promises to continue, for in special lines of fine concentration on precious-metal ores, especially for saving auriferous pyrites (occurring in mines of every gold quartz district), there is bound to be a steady demand for the belt machines.

NOTE.—The cut in the lower corner of page 3, and the three cuts on page 4, have been kindly loaned by Messrs. Fraser & Chalmers, manufacturers of mining machinery and equipment, at Fulton and Union streets, Chicago.—THE EDITOR.

RUBBER TIRES FOR CARRIAGE-WHEELS.

AT the offices of the American Dunlop Tire Co. (New York) a representative of THE INDIA RUBBER WORLD had a talk with Mr. Kirk Brown in relation to the future of the pneumatic tire, in its application to carriages and other vehicles. The conversation was suggested in part by the interview on the same subject with Mr. Brewster, the carriage-manufacturer, printed in the issue of this journal for December 15.

"The solid rubber tire," said Mr. Brown, "must not be in the least confounded with the pneumatic. The former possesses but one of the latter's virtues—noiselessness—and even that in a less degree. Because of the very small portion in actual contact with the ground, its anti-vibrating effect is almost *nil*. On the other hand, the pneumatic tire possesses many additional advantages. Its capacity for absorbing vibration is enormous. If the tires be properly prop rtioned to the weight they have to carry, a vehicle shod with them (whether it be a bicycle or a brougham) will ride as smoothly over a cobblestone pavement as over the best of park roads. There is not the least exaggeration in this statement, but the one condition named is absolutely essential,—that is, the proper proportioning of the tire. Even some bicycles, because of the demand for lightness, have tires too small for the work put upon them.

"This vibration-absorbing quality of the pneumatic tire

can be easily appreciated when it is remembered that the resistance of the road to the wheel is absorbed by the entire volume of air in the whole tire, and not directly transmitted to the body of the vehicle, as in the case of a solid rubber tire, where the only insulation afforded is by the very small portion of the tire in actual contact with the ground,—in case of a heavy brougham, perhaps a cubic inch on each wheel. To sum up, it might be stated as a principle that the whole of a pneumatic tire is always in use, as against only that portion of the solid tire which actually touches the ground. As for the property of noiselessness of the pneumatic, it is so well known that to make comment on that head is unnecessary.

"The pneumatic is a wonderful speed accelerator. Witness the great lowering of the bicycle- and trotting-records since its introduction. This means easy-running, a feature that is as desirable in a heavy carriage as in the lightest sulky."

"To what classes of vehicles is the pneumatic tire adapted?"

"The pneumatic tire has only to be known to become widely used. Its adoption in certain classes of vehicles will be nearly universal; it will be deemed as necessary as springs. The kinds of vehicles it will be used on will include all classes of carriages,—possibly also the lighter variety of omnibusses, ambulances, invalid chairs, etc. We have already fitted tires to buggies, run abouts, chaises, carts, and broughams. We have recently put a pair on an invalid's chair and will shortly fit a set on an ambulance for a hospital in New York city, as has been already reported in your paper."

"Is good paving an essential condition of the use of the rubber tire in this new field? That it is, seems to be the opinion of some authorities on the subject."

"Good paving is not an absolute necessity for the use of pneumatics; in fact, they are more useful and more appreciated on the roughest streets and roads. Any pneumatic tire, to be practicable for carriage use, should consist essentially of an outer protective cover and an inner tube or sac for containing the air. It should be easily detached for purposes of repairs, and should be held on the rim or felly by other means than cement. The lateral strain is much greater in a carriage than in a bicycle; hence the fastening of the tire must be absolutely secure.

"The greatest objection used against pneumatic tires, and the one mentioned by Mr. Brewster, the carriage-manufacturer, is their liability to puncture and cutting, but this is greatly exaggerated. The truth is that a puncture is not as liable to happen as the breaking of an axle or any other disabling accident. Bicycles are used much more roughly than carriages; they are ridden faster, over rougher roads, and greater distances. A bicycle-rider does not hesitate to tour through the roughest and most unsettled country, with a repairing outfit no larger than a pocket matchsafe. He knows from experience that a puncture is no more likely to occur than the breaking of any other part of his machine, and is much more easily repaired.

"Here is a letter just received from J. D. Eggleston, of Washington, D. C., who writes us that he rode a pair of our tires 4000 miles with only slight damage to the outer portion, due to a too-violent use of the brake, and he is still using them without having had the damage repaired. This mileage was made mostly touring in Europe, one trip being made from Munich, Germany, to Genoa, Italy. In all that time his tires have never been punctured. This is only one of thousands. It is not an exceptional thing for a tire to be ridden from 2000 to 5000 miles without damage. What carriage could stand the same use?

"As to the objection on the score of unsightliness, that is only a matter of custom which time will cure, as it has in the case of the bicycle. The old-pattern bicycle-tire is the one that seems unsightly to us now. Once more, do not confound the solid rubber tire with the pneumatic. The former will wear out sooner than an iron tire, while the latter will outlast a dozen.

"It being necessary to make expensive molds for each size of tire, manufacturers have hesitated about putting carriage-tires on the market, but have attempted to adapt the carriage to the regular bicycle-tire. They have thus produced queer-looking freaks which are anything but attractive to horsemen, and have proved to be failures because of the inadequacy of the design of the tires and the insufficient proportioning of them."

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Mr. George R. Bidwell, of the New York Tire Co., was also interviewed on the above subject. He said: "We are manufacturing at present only tires for the lighter carriages. The reason we have not gone more extensively into the vehicle field is not any doubt as to the entire practicability of the idea of using pneumatic tires on all kinds of vehicles, but because the people are not ripe for the extension. We find that there is a great deal of conservatism and prejudice to overcome. The man who has a horse and buggy is apt to study his horse and to know everything about him. But what does he know about his vehicle, or any part of it? Nothing. If it gets out of repair, he never thinks of repairing it himself. For this reason it is difficult to persuade him that a puncture, for instance, is not fatal to a pneumatic tire, and that he can be taught, and provided with the simple means requisite, to make the repairs himself. The man whose tire gets punctured is apt to think that the accidents are bound to happen every day, and he may stubbornly refuse to use the tire again. Now this can be overcome only by trial and experience. Of course, in point of fact, the pneumatic tire on a buggy, carriage, or any other vehicle is a great luxury, and it saves one's nerves as well as purse. A rubber tire will outwear three of the ordinary steel tires. It protects the horse and makes his work much easier for him. I have had rubber tires on my own buggy for the last two years, and I would not think of doing without them. It will, however, require time to bring people at large to a realizing sense of the great advantages of the pneumatic tire and the comparatively few drawbacks there are to offset them."

A. Berneaud & Co., of Pará and Manáos, have had built in Europe a fine new steamer which they call the *Rio Ituxy*, for the Amazon trade.

RECENT DEATHS IN THE RUBBER TRADE.

JAMES BARR CURWEN died at Salem, Mass., on March 23, in his seventy-sixth year. Readers of THE INDIA RUBBER WORLD will remember that an account of his early connection with the rubber-importing trade in the United States was published in our issue of November 15, 1893.

Mr. Curwen was born in Salem, December 20, 1818, and was graduated from the English high school in 1831. He secured a place as clerk in the old Commonwealth bank, where Michael Shepard, John Bertram, and other eminent merchants had control, and whose full confidence he soon acquired. Young Curwen had not served in the bank long before he was engaged by John Bertram to take charge of his books and accounts in his mercantile interests. Later Mr. Curwen was associated with Captain Bertram in his extensive maritime interest, serving as confidential adviser in making investments of the latter's immense income. Captain Bertram died March 22, 1882, leaving an estate worth several millions.

Mr. Curwen was one of the original importers of rubber in this country, the details of his connection with that trade being given pretty fully in THE WORLD of the date above mentioned.

Mr. Curwen was a member of the common council in 1861 and of the Salem water-board for five years following 1878. It was through the generosity of Mr. Curwen that the industrial school which bears his name was established. He was a firm believer in equipping boys with some trade, and, in order to give them the advantage of early training, he furnished all the tools necessary to open the school.

Mr. Curwen was a man of sterling integrity and was held in high esteem. He retired from business some years ago. He was twice married. He leaves a wife who is a sister of Hon. Joseph B. F. Osgood; also two children by his first wife,—George Curwen and Mrs. James Davis, both of North Andover, Mass.

JOHN McCLYMONDS.

THIS gentleman, who had for years been identified with the rubber business, died at Cleveland, Ohio, on March 13, at the advanced age of eighty six years. He founded the Cleveland Rubber Co. in 1870 and was for a time its president, until succeeded by his son, L. K. McClymonds, now general-manager of the Mechanical Rubber Co. The deceased was active in the organization of the Mechanical Rubber Co. and was a member of its directory. Mr. McClymonds led a long and successful life. For fifty years he was prominently identified with the banking business in Ohio. He was one of the organizers of the Union National Bank of Massillon and also of the Ohio National Bank of Cleveland, serving for many years as president of the latter. He retired from active business less than ten years ago. He was a man of great sagacity in business affairs, sound judgment, and high integrity. He died possessing the esteem of all who knew him. His remains were interred at Lake View, Cleveland, on March 15.

MANICOBA, THE RUBBER OF CEARÁ.

AN attractive little volume on "The State of Ceará," prepared by the order of the enterprising governor of that Brazilian state, Dr. Fontenelle, for the World's Columbian Exposition, contains the following:

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RUBBER, the *Jatropha elastica* (maniçoba or sernamby), is a kind of *Euphorbiaceæ*, whose sap contains rubber. Primitive rubber, that which runs immediately from the sap, or crude rubber, is of a light reddish color, becoming afterwards dark as others of its kind. It has, according to the ex-professor of the Polytechnic School (Dr. Saldanha da Gama), the same degree of elasticity, without any difference, of *Siphonia elastica** (rubber tree), as far as the properties required for industry. The resemblance between maniçoba rubber from Ceará and the "seringa" of Pará is such that the market of Liverpool confounds them under the name of Brazil rubber, without paying any attention to the names of the states whence they are exported, or the trees which produce them. The mangabeira (*Hancornia speciosa*), the same botanist informs us, has been an object of exploration under the same point of view; being, however, a shrub, and perhaps less abundant or frequently found, the weight of its rubber must be inferior compared to that of maniçoba from the Uruburetama mountains. The sap of mangabeira, however, has become notable on account of its qualities—as a medicine for pulmonary diseases. Maniçoba abounds in all the state, especially in the districts of Fortaleza, Baturite, and Imperatriz, near the serra of Aratanha, Jubaia, Acarape, Buturite, etc. Senator Pompeu says "that the high prices which this product obtained in the markets from 1854 to 1855 made the people seek for it with ardor. That trial was fatal to commerce and other industries, the buyers receiving the greater part of this product vitiated, on account of the dishonesty of the gatherers."

"The industry of extraction of rubber derived from maniçoba," says the "Relatorio Catalogo" of the commission that gathered products for the exposition of 1875, "has not lately made great progress; it is thus that the province having exported to market in 1855, 234,299 kilograms, during the four years of 1870 to 1874 the average of exportation was [only] 243,916 kilograms. The Ceará rubber is badly prepared; it is the general opinion that it cannot compete with that of Pará. Its method of extraction is the same followed by the old routine. They make

* Now known as the *Hevea Brasiliensis*.

incisions in the trunk of the tree in such a way that they surround it completely, and thus mutilate it. As soon as the sap which flows from these incisions is coagulated it is taken to the market; it has no uses whatever in the province, it is all exported. The price per kilogram averages [?] 1$100 [= 27.23 cents per pound]. It is long since the extraction of mangabeira rubber commenced in this province; several samples having been sent to Europe prepared in different ways; and, according to information received by this commission, it has been well received, so that it forms at present a new industry."

Notwithstanding the fluctuations of prices in foreign markets and the imperfection of the industry, it prospered satisfactorily from 1867 to 1877, when it declined with the general disaster which reduced the province to misery. It was not abandoned, however, and it shows a tendency to newly develop itself. It is probable that the knowledge acquired by the Ceará people who come [back] from [gathering rubber on] the Amazon will be useful to this industry, worthy of all encouragement.

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THE average annual production of Ceará rubber, for periods of five years, is stated to have been as follows:

PERIODS.	Pounds.
Between 1846 and 1850	9,095
Between 1851 and 1855	109,679
Between 1856 and 1860	53,152
Between 1861 and 1865	147,989
Between 1866 and 1870	148,852
Between 1871 and 1875	560,518
Between 1876 and 1880	254,366
Between 1881 and 1885	126,211
Between 1886 and 1889	420,849

The state of Ceará lies on the Atlantic coast, south of Pará, the state of Maranham intervening. The principal shipping port is Ceará, or Fortaleza, the capital of the state. The commercial and industrial development of the state made little progress before 1866, when steam navigation for Liverpool and Lisbon was opened. The growth of these interests of late has been on an important scale.

RUBBER-TREES ON BRAZILIAN UPLANDS.

APROPOS of the frequent assertion that the India-rubber tree grows in swamp-lands, rendering rubber gathering unhealthful, it may be of interest to quote from a report made by Mr. H. A. Wickham some years ago to the British government:

"In Venezuela and Brazil I found the *Hevea* growing on two classes of country: the high clayey uplands embraced by the branching rivers, but still at considerable distance from them, and on the low alluvial lands immediately bordering on them.

"From the far greater size and apparent age of the trees, I cannot but imagine that the original locality of the trees was in these uplands. The fact of their being so generally found on low lands bordering on the waters may be accounted for. The seeds are scattered widely when they burst; many of them fall into ravines and gullies, and are carried by the water-courses of the rainy season into the rivers, to be cast up by tide and windy squalls, and readily take root on the rich soil of the alluvial islands and shores of the back-waters. In illustration of this I have frequently seen a string of *Heveas* growing even on a beach backed by sandy lands, far from their proper localities. * * * It is a mistake, naturally fallen into by the travelers who have passed up and down the great waterways of South America, without having penetrated far into the interior high clay lands enclosed by them, to suppose that the *Hevea* is confined to the low, often-flooded islands and margins of rivers. Growing on these clayey uplands, I met with the largest of these trees, rivaling in height and girth all but the very largest trees which grow in these parts."

THE STORAGE OF INDIA-RUBBER SOLUTION.

A CASE of considerable interest to the India-rubber and cycle trades was decided at the Birmingham (England) police court on February 22. The India-Rubber, Gutta-Percha, and Telegraph Works Co. (Limited) was summoned, under the petroleum act of 1874, for storing without a license, at their depot in Albert square, Birmingham, 1277 pounds of India-rubber solution, which contained 84.8 per cent. of naphtha. It was contended that this commodity came within the meaning of the act, and that a license was required for its storage. It gave off inflammable vapor at 54° F., instead of at 73° F.

Mr. A. Young, for the defendant company, contended that the act was never intended to apply to petroleum in combination with an article of commerce, but merely to petroleum and other oils specified, pure and simple. After hearing the evidence, the bench fined the defendants the nominal penalty of 40*s.* and costs, intimating that in future similar offences would be more heavily dealt with. They, however, expressed the hope that the solution, which was valued at £100, would not be forfeited if defendants made the required provision for its storage.—*The Electrician* (*London*).

SOME ENGLISH RUBBER CONCERNS.

THE Liverpool Rubber Co., Limited, report for their thirty-fourth year (1893), notwithstanding the depression in trade, a net profit of $42,230. The dividends for the year, on both preference and ordinary shares, amounted to 10 per cent. A fire-insurance fund was started with $5000, as a protest against the excessive rates now charged by the insurance company. The reserve fund of the company now amounts to $51,080, part of which is to be utilized at once in the erection of additional works.

At the annual meeting of George Angus & Co. it was stated that the continued depression in shipping had largely militated against their rubber business. They had not, however, suffered a single loss from bad debts during 1893, and the profits for the year reached $168,635.

Ferguson, Shiers & Co. are a new concern organized for the manufacture of waterproof goods by George E. Ferguson and Frederick A. Shiers, lately connected with Lazarus Mistovski & Co., of Manchester and Lancashire. Their manufacturing will be conducted at the Phœnix mills, Failsworth, by Mr. Ferguson, and premises will also be occupied at No. 31 Blossom street, Ancoats, Manchester, under charge of Mr. Shiers.

The Newton Rubber Works, Bromley street, Hightown, Manchester, are in course of erection by B. Cohen. The management will be in the hands of Mr. Metcalf. The machinery is being supplied by Francis Shaw & Co., of Bradford, Manchester. Electricity is to be used in lighting the works.

The above notes have been compiled from the *India-Rubber and Gutta-Percha Trades Journal*, of London.

LETTERS TO THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: I send you by mail a sample of *reclaimed rubber shoddy substitute*. The price of old boots and shoes to-day is 5½ cents a pound. This sample, all ready for use, can be put on the market at 5 cents a pound. If you know of any one who is interested in the matter of cheaper recovered rubber I should be pleased to send, through you, working samples for them to try.

C. T. T.

[THE matter of cheaper recovered rubber is of course one of vital interest to almost all branches of the rubber trade. The sample spoken of in the letter appears to be excellent. It is a clear black, free from fiber or foreign material, and looks as if, considering the present price of recovered rubber, it might well be worth from from 5 to 7 cents a pound.—THE EDITOR.]

WHO MAKES BALLOON CLOTH?

TO THE EDITOR OF THE INDIA RUBBER WORLD: I should like to have the address of a rubber-manufacturer who makes rubber cloth. I am going to make a balloon out of it. I have a government appointment in Boston this season in the signal service. Any information you can give me in regard to rubber coated on silk will be thankfully received. T. S. BALDWIN.

Quincy, Ill., March 15, 1894.

[MR. BALDWIN is one of the well-known Baldwin brothers, who are aëronautical engineers and who claim to be the inventors of the parachute. They have long been in the business of making gas- and hot-air balloon ascensions, parachute drops, tower dives, etc. They have exhibited in all parts of the world and have medals from the crowned heads of Europe. —THE EDITOR.]

MAKING RUBBER STICK TO IRON.

TO THE EDITOR OF THE INDIA RUBBER WORLD: I am now trying to make something in the rubber line where I use a small piece of iron which is to be entirely covered with rubber. I should like to have the rubber stick to the iron when finished. I thought there might be something which the rubber trade would know about that could be used to submerge the small iron piece in before using, thus making the rubber cling. In telling me this you will confer a great favor on one who has always been a true friend of THE INDIA RUBBER WORLD. I. S. H.

Boston, March 15, 1894.

[THE matter of causing vulcanized rubber to cling closely to iron has been the subject of many patents and much litigation. Exactly what those patents cover to day, or how many have expired, we are not prepared to say. A simple formula, however, and one well known to the trade, is to dip the metal into acid to remove all grease, after which the rubber sticks. Oil of vitriol is said to be usually employed. Another process is to have a very thin plate of copper deposited upon the metal, the rubber treated vulcanizing, forming a combination with the copper, and sticking so fast that it is almost impossible for it to be removed.—THE EDITOR.]

BOOKS ON RUBBER-MANUFACTURE.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Please advise me if there are any books printed on India-rubber, treating particularly of hard rubber,—how molded and turned and polished; also, what is the best material for molds.

T. S. W.

Indianapolis, Ind., March 10, 1894.

[THERE is nothing really valuable in the way of books on India-rubber, nor is there a treatise on the manufacture of hard rubber that would teach one how to make it. The molds are made from either iron or steel, or soft metal, but usually the best are from a close-grained iron. We would suggest that if you have anything to make in hard rubber it would be cheaper and easier for you to deal with some concern already manufacturing goods of that kind.—THE EDITOR.]

TO THE EDITOR OF THE INDIA RUBBER WORLD: Being desirous of obtaining a work on rubber, its compounding and vulcanization, I wish to ask your kind advice in the matter. I would like to obtain such instruction in the matter as to become intelligently versed in it. PAUL S. COHN.

Rutherford, N. J., March 14, 1894.

[WE really cannot refer you to anything better than the files of our paper.—THE EDITOR.]

THIS INVITES ADVERTISING.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Will you please send me the address of some jobber of Gutta-percha tissue? I ask you this information as I know of no other place to write to. A. E. BARNEY.

Logansport, Ind., March 12, 1894.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Please give names of companies who manufacture Gutta-percha for the mechanical trade, such as patterns of brass castings.

EXCELSIOR BRASS WORKS.

Dubuque, Iowa, March 24, 1824.

THEY WANT THE PNEUMATIC SKATE.

THE INDIA RUBBER WORLD has received letters from the trade in many parts of the country asking for particulars regarding the pneumatic road-skate, described and illustrated in the department of "New Goods and Specialties" in our issue of November 15, 1893. Among those who have written are Hubert Levy, Louisville, Ky.; F. A. Heebner, Minneapolis, Minn.; and R. A. Hume, Vicksburg, Miss. We have no information concerning this article other than what has been published in our pages, and do not know that it is manufactured in the United States.

THE SPRING TRADE IN GARDEN-HOSE.

SOON after the first of the year the salesmen from the various mechanical rubber factories start out for orders on garden-hose. Most of those taken are for delivery in the early spring, and as a rule there is no difficulty in securing a large number before February. This year, however, the conditions have been different. The supply-men, although sure that they would use hose, and perhaps sell as much or more than ever before, hesitated about placing their orders. This was due partly to the retailers' feeling that there might be a lowering of price in garden-hose. Both of these reasons are now rapidly losing their efficiency. Trade is steadily improving. Prices are about the same as they were, and orders are coming in. Manufacturers and jobbers the country over are reporting good sales, and the salesmen are again out for orders. The warm and pleasant weather was no small factor in this change of attitude of the retailer. If in addition to this good start we have an early and balmy spring, with the prospect of a warm, dry summer, the output of garden-hose for 1894 will equal or excel that of any previous year.

THE business of repairing wringer-rolls might be thought a small one, yet Prescott Brothers, Cornhill, Boston, keep a force of men at work putting new rolls on damaged wringers.

CONTRIBUTIONS TO THE CHEMISTRY OF INDIA-RUBBER.

By P. Carter Bell, F. I. C., F. C. S.

III.—EFFECTS OF METALLIC SUBSTANCES UPON CAOUTCHOUC.

THE extraordinary behavior of some of these metallic substances with rubber is exceedingly novel. In some cases metallic substances belonging to a group have little or no effect, while others of the same group have a powerful energetic action. The gradual decay of the caoutchouc in contact with these elements varies considerably, according to the substance with which it is incorporated. Many instances have arisen, where this peculiar destructive influence is brought about, when these metallic bodies are only partially in contact with the caoutchouc. Caoutchouc seems to have the power of assimilating these metallic bodies to such a degree that, in however small a quantity may be this destructive influence, it is gradually assimilated, bringing about a complicated chemical reaction. The results of these decompositions vary according to the amount of metallic substances and to the foreign matter present. These reactions can be produced, in many instances, very rapidly, —so rapidly that the intermediate products of decomposition are considerably masked ; these products, produced by this gradual development of the reaction, are then lost.

The reason for these gradual decompositions which result by the intervention of some of the elementary metallic bodies is at present involved in great obscurity. The actual physical change of caoutchouc in contact with them is very apparent, but what chemical action has taken place is exceedingly difficult to understand. Whether these elementary bodies form definite chemical compounds with caoutchouc, or whether they act as merely catalytic bodies, bringing about a reconstruction or condensation of the arrangement of the elementary constituents of caoutchouc, remains to be proven.

In the case of the non-metallic body, sulphur, a little light has been thrown upon the subject. The decomposition or vulcanization of caoutchouc in contact with sulphur was at first supposed to be a catalytic reaction,—*i. e.*, by the mere presence of sulphur a reconstruction of the molecular atoms of caoutchouc took place,—but recent investigations and observations of its behavior have definitely overthrown that idea. It is true, as investigators say, that the greater amount of the sulphur used for vulcanization can be recovered ; but they have gone so far as to say that if the chemical processes employed were more perfect in their solvent properties the whole amount of the sulphur would be recovered. This is not so. Although it requires such an enormous amount of sulphur to bring about vulcanization, the caoutchouc only requires an infinitesimal quantity to change it. The small amount of sulphur which cannot be recovered by any known chemical means at our disposal actually has entered into combination with the caoutchouc, forming a totally different molecular reconstruction ; therefore the combination of sulphur with caoutchouc is a sulphur derivative, and by no chemical or physical means can this combined sulphur be eliminated.

While on this subject I will mention the misunderstanding, so prevalent in the trade, concerning the devulcanization of "waste-rubber." Judging the process of "devulcanization" from a chemical aspect, the ideas are totally erroneous. The rubber cannot be brought back again to its original state, for when once the rubber has been heated in contact with sulphur, no known physical or chemical processes can ever restore it to its former character. The physical and chemical processes employed during the recovery of the waste-rubber are simply used to remove the foreign matter as cotton-fiber, mineral matter, and the various substitutes employed in the preparation of the rubber compounds, thus obtaining a purified vulcanized rubber, and not, as some suppose, a *devulcanized* rubber.

It will be asked, how is it known that the caoutchouc has absorbed a certain amount of sulphur and that such a reaction has taken place? It can be demonstrated in many ways. It is a fact, well known among India-rubber manufacturers, that during vulcanization a peculiar gas is given off that has the smell of rotten eggs. In vulcanization by steam direct this odor is considerably diluted ; therefore its peculiarity is not detected. This gaseous substance which is always eliminated in such a process is "sulphuretted hydrogen."

The most delicate method of detecting the presence of this gaseous body during vulcanization is to hang in the vulcanizer, upon a string, strips of filter-paper previously dipped in a 10-per-cent. solution of acetate of lead (soluble salts of lead being exceedingly sensitive to the action of sulphuretted hydrogen). The prepared paper will be gradually turned black, proving its presence.

The evolution of sulphuretted hydrogen during vulcanization is a conclusive proof that a vulcanized caoutchouc is a "substituted product." Caoutchouc is very susceptible to the influence of sulphur and bodies of the same group, and thus a large number of derivatives may be made, differing from the crude caoutchouc in that they contain one or more atoms of sulphur in the place of the same number of hydrogen atoms. This is the reason that so many hard and soft rubbers can be produced—they are intermediate sulphur products between the highest and lowest of the sulphur derivatives. It must be borne in mind that the mere fact that sulphur, in acting upon caoutchouc, replaces an equivalent quantity of hydrogen, does not prove that the sulphur in the product occupies the same place that the replaced hydrogen did. Nevertheless, it must be assumed that the substituting atom does occupy the same place, or bear the same relation to the carbon atom that the hydrogen did. Why this theory must be regarded as the actual fact will be discussed later on.

If a vulcanized rubber of a certain degree of pliability

is required, the manufacturer incorporates a sufficient quantity of sulphur to bring about this state in a known time; if more or less sulphur than that quantity is used and the rubber compounds subsequently treated under the same conditions, harder or softer rubbers, respectively, are obtained. Why is this so? If the reaction during vulcanization had been catalytic, only one vulcanized rubber could have been produced, whereas many sulphur-derivatives are obtainable. If a catalytic change is brought about by the sulphur, how is it that a gradual increase of sulphur in the rubber forms such a number of new chemical bodies? In such reactions, produced by catalysis, when the maximum limit is obtained there ends the reaction; but in the case of rubber there seems to be no maximum limit as new chemical substances can be produced with sulphur ad infinitum.

The different intermediate products of vulcanization can be brought about with the same percentage of sulphur but subjecting the rubber compounds to a longer heat, just the same as by using excessive quantities of sulphur. The reason why large excesses of sulphur are more expeditious than the amount absolutely requisite to bring about vulcanization is owing to the impossibility of bringing every atom of sulphur in contact with every molecule of caoutchouc. This can only be effected in liquids; if the sulphur could be brought intimately into contact with the caoutchouc molecules, vulcanization would take place immediately, and this can be done as follows:

If dry chlorin gas is made to pass over flowers of sulphur in the cold for some time, a yellow amber liquid is obtained, containing 47.4 per cent. sulphur and 52.6 per cent. chlorin. This chemical substance has very powerful and energetic vulcanizing properties. A thin piece of rubber immersed in the liquid instantly becomes changed into the new modification; the action is so powerful that the rubber becomes quite hard. To somewhat allay its violent action it is diluted with some suitable solvent.

Pure caoutchouc gum is dissolved in a large quantity of carbon bisulphid (10 parts of gum in 90 parts of carbon bisulphid); to this a 5-per-cent. solution of dichlorid of sulphur in the same menstruum is cautiously added immediately after an equal volume of a 90 per-cent. alcohol is thoroughly mixed with it until the whole of the vulcanized caoutchouc is completely precipitated. By this means a pure vulcanized caoutchouc or a sulphur-derivative is obtained in a fine elastic mass; when thoroughly washed and dried a splendid vulcanized compound is produced. The amount of sulphur which has been absorbed is considerably under 1 per cent.

The reaction which has taken place is exceedingly complicated. Caoutchouc is a hydrocarbon of the group $C_n H_{2n-2}$ and no doubt belongs to a turpene or acetylene series of organic compounds. Sulphur dichlorid acts upon the hydrogen atoms, eliminating during the reaction hydrochloric acid and substituting sulphur in their place. In this way a sulphur-derivative is produced.

THE RELATION OF RUBBER-GATHERING TO MANUFACTURE.

By Francis Harvey, A. M. I. C. E.

SO much has been written already about rubber-manufacture that it would appear hardly possible to add anything new on the subject. But in this, as in every other industry that is dependent for the supply of its raw material upon wild and almost unknown regions, the means and possibilities of production are apt to get overlooked, and fail to receive the attention that their importance demands. In the case of rubber, particularly, many of the difficulties experienced in treating and working up the raw material are traceable directly to the carelessness and ignorance of those engaged in its production, and a point gained at this stage of the industry is often of more vital importance and value than half the researches and experiments carried out by chemists upon the impure and adulterated material brought to market. The trouble in obtaining raw rubber is owing first of all, perhaps, in great measure to the unhealthfulness and inaccessibility of the rubber districts. These are such as to prevent proper supervision, thus leaving the gathering and preparation of the gum in the hands of the Indians; which means the indiscriminate admixture of the sap of old and young trees, and of every variety of rubber-tree, which is often positively injurious to the quality of the product.

The method pursued by the Indians in gathering rubber on the Orinoco, Apuré, and upper Meta rivers, which have been visited lately by the writer, is as follows: The banks of the rivers mentioned are covered in places for miles with varieties of *Hevea* which are identical with the trees on the Amazon from which the true Pará rubber is obtained. At present in these districts, the industry being in its infancy, the work is entirely carried on along the banks of the streams, although the whole of the forest region is more or less rich in rubber-trees. On the Meta, which is in Colombia, felling the tree is not prohibited, but on the other rivers named, which are in Venezuela, the destruction of the trees is in violation of the law, and tapping is the only method allowed. But on account of the distance from the seat of government often no attention is paid to these decrees, and the Indians, studying their own convenience, do exactly as they please.

The work is commenced, after a convenient site has been chosen, by clearing a path through the bush, leading from tree to tree. The trees are then scraped, to remove all moss, vines, and loose substances, and a *liana* is bent round the trunk at a height of a few inches above the ground. The *liana* (a rope made of vines) is placed in a slanting position, so that the juice runs towards one side. The ends of the *liana* being fastened together with small creepers, the whole is covered over with clay, and the space between it and the trunk well smeared over, forming a small gutter which leads all the sap flowing down the trunk of the tree to the lowest end, at which is placed a

small earthenware vessel, or a hole is made in the ground and lined with leaves to receive the gum. The trees are tapped every second day, the number of incisions in the bark varying from eight to sixteen, or even more in extra large trees. In some instances the tree is ringed, which of course kills it. After the tapping, sap continues to run for three or four hours, and while this is going on a fire is made. With a piece of wood made in the shape of a small smooth paddle the Indians stir the sap until the paddle is completely coated, when it is held in the smoke until the rubber is coagulated. It is then again coated with sap and the process repeated over and over until the mass of rubber is sufficiently thick, when it is removed by opening it with a knife. The Indians adulterate the rubber with the milky juice of other trees—chiefly of the Balata family—and the gum is collected from trees of all ages, with the most reckless disregard of the quality. What is worse, such substances as stones, sand, wood, etc., are added to increase the weight.

The chief action of the smoke seems to be to coagulate the rubber in the sap and preserve it, and although experiments have been tried with various chemicals, it would appear that for economy, convenience, and effectiveness the smoke cannot be superseded. It must be said, however, that considerable success attended the experiments conducted by Dr. Lucien Morisse, who found that a number of chemical reagents coagulated the rubber satisfactorily, the best and most economical of them being ordinary sulphuric acid. In practice one part of acid is taken to about 500 parts of sap, but to this must be added a small portion of carbolic acid as an antiseptic, as otherwise the gum treated with sulphuric acid alone soon begins to decompose and becomes covered with fungoid growth. The rubber thus treated is white and of great purity, and the acid so far facilitates the work of coagulation—otherwise a long and tedious operation—that it would be possible for a good American workman with a little practice to produce at least 100 pounds of rubber per day.

But it is very doubtful if white labor could contend with the difficulties and hardships of climate and locality, together with the general conditions of a rubber-gatherer's life. The trees grow mostly on the rich alluvial soil of the low-lying land along the banks of the rivers, subject to periodical inundations during the rainy seasons, while the thermometer is rarely much below 90° F. in the shade. The damp ground teems with the rankest of tropical vegetation, forming a perfect hotbed for malarial and remittent fevers, while the dense jungle around is the home of innumerable snakes, jaguars, pumas, and almost every conceivable moving and creeping insect, the sting from many of which, in such a climate, proves fatal. Of course to all these the Indians are inured, but the amount and duration of their listless labor is regulated entirely by their temporary needs and wants, which as a rule are few and easily supplied. Having no ambition, they perform their work in a careless and indifferent manner, while the supply of rubber is very irregularly kept up and the quality still more uncertain.

With this hand-to-mouth policy countenanced and recognized by the trade, with its wholesale destruction of the trees along the banks of the navigable rivers, the time when the supply of rubber must come from the interior is not far remote. It can readily be understood that the farther from the rivers the Indians have to gather the gum the greater will be the difficulties of transport, aggravated by the increased hardship and danger of journeying through miles of swamps and jungles. Moreover, the Indians may be expected to become more careless and indifferent in selecting trees from which to obtain the rubber. The quality of rubber yield may, and doubtless for some time will, be kept up. But those who have been long in the business of rubber-manufacture know that during the past eight or ten years there has been a deterioration of the quality of the crude gum. This has resulted from the admixture of the sap of trees of mature growth with immature saplings, and, secondly, the gums of the different varieties, which is an obstacle to the manufacture of first-class goods. As the manufacture of rubber is entirely in the hands of large firms, the drawbacks and difficulties experienced from this indiscriminate admixture of gums is known and felt chiefly by the superintendents of the compounding departments, who are expected to work miracles as to quantity and quality in dealing with material utterly unfitted to stand the standard compounding of previous years.

Undoubtedly where the greatest difficulty is experienced in supplying the demands of the trade is in the manufacture of tires for carriages and bicycles, which require the purest Pará gum, gathered only from mature trees—an article hardly obtainable to-day in the market, and then only in very limited and uncertain quantity. The compounding for these articles is at present about half and half, and does not give satisfaction, being often unreliable, as the rubber lacks that toughness and elasticity necessary—splitting and cutting and often breaking off—for which the public blames the manufacturer, who in turn saddles the sins and shortcomings of the gatherers upon his unfortunate superintendent. But the manufacturer, with the proper grade of rubber, could compound at 75 per cent. instead of at 50 per cent., producing a far superior and much more durable article at considerable less cost.

A great deal has been said as to the necessity and advantages of planting rubber-trees, and the Mexican government has taken active and substantial steps in this direction by offering premiums to those embarking in this new enterprise. The advantages to the government are very doubtful, however, for a little more energy and system in developing and preserving the vast regions already under rubber would have seemed a wiser and more beneficial course. Indeed, if all the governments controlling rubber lands would take active possession of them and subdivide them into districts over which an inspector could be held responsible alike for the preservation of the trees and the class of rubber exported therefrom (upon which a small export duty might be charged to meet the expense), there would be no trouble at the present with the gum, in either quality or quantity, and no anxiety for the future.

As long as the trees along the river-side are protected

and allowed to seed, nature herself will steadily increase the area under rubber, for with each flood the seeds are carried in untold millions and scattered and planted further and further away, and on new land with each change of course of the river or stream, which is of such common occurrence with tropical streams. Some conception of the truth of the latter may be formed when it is known that the Orinoco—the deepest river in the world, and often two to three miles wide—rises in flood-time from 20 to 50 feet, while at Cuidad Bolivar, five hundred miles from the mouth, where the river is about three-quarters of a mile wide, the rise is from 70 to 80 feet during the rainy season.

The work of gathering rubber in Colombia, on the Meta, and in Venezuela, on the different rivers right through to the Amazon districts, is, as I have said, in the hands of Indians. The negro population seems not only thoroughly unfitted for the work, but also to have a decided abhorrence for the life in general, so that the regulation of the industry will always be in these regions a difficult task. The Indians are not so tractable or amenable to reason or the requirements of civilization as their black brethren. Still, if some system of personal supervision, with trusted and experienced head men of small gangs responsible for the quality and quantity of the gum gathered, were introduced, say in the rich rubber districts on the Orinoco, where the trade is in its infancy, and inducements held out for gathering only pure gum of matured trees of like varieties there is no doubt that the supply would soon adjust itself to the requirements and increasing demands of the trade.

EXPERT TESTIMONY IN THE ACID PATENT SUIT.

IN the infringement suit of the Chemical Rubber Co. *vs.* Goodyear's Metallic Rubber Shoe Co. and Emmett A. Saunders* the following testimony was given for the defense:

CHARLES H. HAYWARD, of Stoneham, Mass., testified that he had charge of what is known as the Haywardville property. He was one of the patentees of Patent No. 40,407, granted to C. H. Hayward and Daniel E. Hayward, for a process for recovering waste-rubber. He began in the rubber business in 1853 at Providence, being employed by the Hartshorn Rubber Shoe Co. Later he worked at Colchester for the Hayward Rubber Co. for four years, then for the Boston Rubber Shoe Co., at Malden, for one year. He was employed by the N. Hayward Co., at Stoneham, from 1859 to 1870. When the Haywardville Rubber Sole Shoe Co. was started, he was a stockholder in that company and, with his brother Daniel (they being nephews of Nathaniel Hayward), was employed by the Haywardville Co. He testified that he had experimented extensively, one line being in that of the acid recovery of scrap. His first experiment with acid was in 1861. He then used a half-hogshead two thirds full of water, rubber rags, and acid. The solution was heated by a perforated lead pipe which ran to the bottom of the hogshead. He had no exact formula at that time but put in acid enough to burn out the fiber. He steamed the solution from twelve to twenty-four hours. He used this half-hogshead in experimenting about a year. In 1862 he built a tank 17′ 7″ long, 4′ 6″ wide, and 2′ 9″ in depth. To heat this he had a perforated copper pipe run around the inside of the bottom of the tank. This he filled with about the same proportions of water, acid, and rags as were used in the half hogshead, and the solution was boiled about the same length of time. For acid he used oil of vitriol at 66°. He testified that he put in simply enough acid to burn out the fiber, and had no regular rule, as some kinds of stock needed more than others. He noted that the more acid there was used the quicker the fiber was destroyed. After the fiber was burned, he washed the product in a paper-engine. In reply to questions he testified that the pipe was perforated to distribute the steam freely throughout the solution. The steam came from a boiler fifty feet away, where from 80 to 100 pounds pressure was carried. The large tank described was built because of an order for army-blankets received from the United States government. They made from 1500 to 2000 of these blankets daily, using the acid stock in them. This continued for about three months, when they were forced to stop it, because they were sued by Charles Goodyear on account of their infringement of his sulphur patents. This suit was settled by the payment of $15,000 and the relinquishment of the right to continue the business.

With regard to the recovery of stock by his process, he testified that it was perfectly satisfactory. The tank, he said, was now in the cellar of the factory at Haywardville. There was also there a boiler or dryer used in drying the product after it had been treated and washed. This boiler was a jacketed one and could be used either with dry heat or wet heat. He testified that the perforated copper pipe which ran around the bottom of the tank was made of inch pipe, the perforations being two or three inches apart, so that the steam should be thoroughly distributed through the acid, water, and rags. The liquid was usually left in the tank. A little new acid and water was added each time before a new batch was put in. This liquid was occasionally run off because fiber and waste material accumulated in the bottom of the tank.

He testified that sulphuric acid was used for no other purpose by the Haywardville company than the recovery of scrap. He believed, however, that Nathaniel Hayward used the same process on old boots and shoes. After the Haywardville Rubber Sole Shoe Co. ceased to do business, Mr. Lochman took the business, making boots, shoes, spittoons, etc. He ran this for one year, then T. C. Weeks took it, running it for a year. Mr. Weeks formed at the expiration of this year the Haywardville Rubber Shoe Co., which ran one year, the plant being then purchased by Mr

* In THE INDIA RUBBER WORLD of October 15, 1893, will be found the particulars of the points at issue in this suit. Portions of the testimony taken have appeared in the issues of January 15, February 15, and March 15.—THE EDITOR.

Weeks. It has been used little since, except for a time when it was used as an experimental plant for producing aluminum. He said that the plant was still owned by Mr. Weeks. He testified that the Haywardville property had been run during those years without a license from Charles Goodyear, although the Goodyear patents were then in force. The rags used for recovery came from Colchester, Conn. He showed samples of rubber recovered by him about a month previous, and described the process in detail, stating that it was similar to that used by him years previous. He secured a barrel of rubber rags from the Boston Rubber Shoe Co. He used a half-hogshead with a perforated lead pipe to let in the steam, at a pressure of from 80 to 100 pounds, and boiled the solution twenty-four hours. He took the product, washed it, and dried it out. The rest of the product was still there on the factory floor. The acid he purchased of the Cochrane Chemical Co. Referring again to the blanket order, he testified that they discontinued the work because the Union Rubber Clothing Co. had secured from Charles Goodyear the right to make blankets.

John C. Bickford, of Bristol, R. I., testified that he had worked at Haywardville from 1859 to 1867. He worked on the stock for making blankets and also in the curing of them. He described the tank mentioned in Hayward's testimony, and also testified as to filling it with acid, water, and rags. His testimony was quite similar to that given by Charles Hayward regarding apparatus, process, plan of treatment, etc. A point in his testimony was that the acid used destroyed wool fiber as well as cotton. On cross examination the points that he brought out were that he entered the rubber business as a boy when he was fourteen years old, working for four years for Charles Goodyear at East Woburn, Mass. He helped the great inventor there in his experiments, his business being to wait upon him. Later he worked for the Candee Rubber Co., at Hampden, Conn., then was employed at Lisbon by Nathaniel Hayward, after which he went to Colchester, working for the Hayward Rubber Co. for twelve or fourteen years. Leaving the Hayward works he went to Haywardville and later worked for the Elastic Fabrics Co. in Chelsea, Mass., for one year, after which he went to Bristol, and has been employed with the National India Rubber Co. ever since. When questioned relative to the compound used on the rags that were treated with acid, gave it as follows: 4 pounds of rubber, 4 ounces of sulphur, 8 pounds of whiting, 8 pounds of litharge, and 8 pounds of calcine plaster.

Edwin A. Hayes, foreman of the grinding-room of the Boston Rubber Shoe Co., testified that he worked at Haywardville from August, 1860, to May, 1864. He testified that in 1861, in company with Nathaniel Hayward, he attempted to recover rubber from old shoes by the acid process. He put the shoes whole into a bucket containing acid and water and discovered that the linings were rotted by the acid. The shoes were afterwards cracked up, put into a hogshead, and washed in a paper engine. By this means the fiber was entirely destroyed. The acid used in this experiment was sulphuric acid. He described the hogshead and tank, steam-pipe, jacketed boiler, and other apparatus spoken of in the Hayward testimony. He also testified as to amounts of water, acid, etc., that were used. In response to a question he testified that wool was destroyed by the acid process, as they had what were known as green felt clippings that were recovered in this manner.

MR. KIMBLE'S ATOMIZER FOR SHODDY.

THE mechanical engineer of a large rubber-factory has written to The India Rubber World, asking the address of the manufacturer of a machine for atomizing rubber which was described in The World of January 15. As others may be interested in this same machine, which promises to work a revolution in the recovered-rubber business, we are glad to inform our readers that Mr. Smith W. Kimble, the inventor and manufacturer, may be found at No. 444 Pearl street, New York. For some time past Mr. Kimble has been devoting his whole time to the problem of atomizing shoddy by the use of his machine. He probably has finished by this time fitting the Philadelphia Rubber Works with these machines, and it is rumored that very soon some of the other plants of the Rubber Reclaiming Co. will adopt the atomizer. The process as described to us, as it is now installed, is a system of three machines similar to that illustrated in The India Rubber World, No. 1 being fitted to take old rubber boots and shoes into a hopper without any breaking up, where it cracks them roughly, passes the material to No. 2, which makes a finer division, and from there to No. 3, which still further reduces the shoddy, and then passes it into the atomizer, which reduces it to fine powder. From the atomizer it is taken away as fast as pulverized by an exhaust-fan into a large closed chamber, where, so strong is the force of the air current, the fiber drops in one part of the chamber, while the finer rubber is blown to the further end. A sample of rubber thus treated is in our possession, and is one of the best samples of mechanically-recovered rubber that we have seen. It is said that Mr. Kimble has sold his right to use this machine in the United States to the Rubber Reclaiming Co. Whether this is so or not, it will be worth while for rubber-manufacturers to see the atomizer as it runs at Mr. Kimble's Pearl-street office.

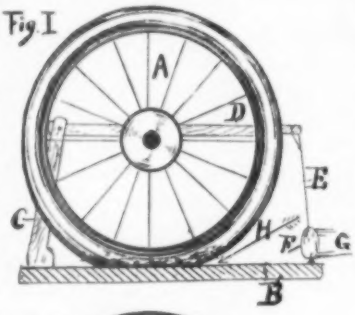
NOVEL USE OF RUBBER IN RUGS.

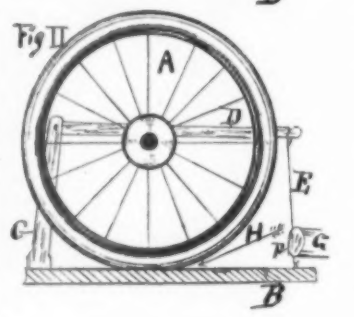
ONE of the most pronounced novelties recently exhibited to the trade is the reversible rubber rug or carpet. This fabric, says the *American Carpet and Upholstery Trade*, consists of a thin sheet of perforated rubber cloth, similar to that used in the manufacture of boots. The yarn is forced through the little holes. It is then automatically spread on both sides of the rubber sheeting, and the rug is manufactured. The strong features of the product are its durability and its reversibility; also its low cost of manufacture. In appearance it looks exactly like a moquette or other pile fabric, and only an examination would reveal the difference in structure. Jute as a filling being entirely done away with, the only expense is for yarn and rubber.

PAPER TIRES AS A SUBSTITUTE FOR RUBBER.

By Victor Yarros.

FROM a report in the *Paper Trade Journal*, it appears that there are certain experiments making with the object of determining the possibility of using a pneumatic *paper* tire on bicycle wheels and thus displacing, or diminishing the use of, the pneumatic rubber tire. As the subject is one in which the whole rubber trade is interested, the writer has endeavored to obtain both the available information as to the actual facts and the opinions of competent men with regard to the theoretical side of the question. The rubber trade knows of no similar attempts in the past. Up to date, paper was not thought of as a possible rival of rubber in the tire line, and if anything new and unexpected is coming, the trade wants to know the nature and extent of the revolution.





There are said to be several reasons why attempts should be made to supplant the rubber tire, if possible, but the principal reasons are these: the cost, and the liability to puncture. With regard to the former, it is claimed that bicycles are too expensive and that the use of the pneumatic rubber tire adds about $20 to the cost of the wheel. Now the average clerk or workman would gladly buy a machine if he could get one at a reasonable price, but $100 or even $65 is beyond his financial power. The inventors and champions of the paper pneumatic tire claim that a saving of $12 will be effected by substituting the paper for the rubber tire, a pair of the former costing only $8. So far as this reason goes, it is clear that the relation between the premises and the conclusion irrepressively recalls the saying about the mountain laboring and bringing forth a mouse. If the new dispensation will do no more for the poor workman, at present vainly yearning for a machine, than reduce the price by the sum of $12, it is much to be feared that no boom in the bicycle trade will take place. The man who can pay $88 can pay $100; conversely, the man who cannot pay $100 cannot pay $88.

Still, in this hard world, and particularly in dull times, $12 is a sum not to be despised, and if a paper tire costing that much less will do the work as well as the rubber tire, there is evidently money in the new invention. And this brings us to the *second* reason for the attempt to substitute paper for rubber. It is claimed that paper will do more and better work than rubber; that whereas the life of a rubber tire is two seasons, the life of the paper tire will be five years or even more; that in point of elasticity it will not prove inferior to rubber; and that in some respects it will be actually superior. The illustrations herewith given are intended to show the superiority of the paper tire. In Figures 1 and 2, there are two wheels, *A*, *A*. Then there are stands of wood, *B*, *B*. Next are the uprights, *C*, *C*; the levers, *D*, *D*; the ropes, *E*, *E*; the pulley-blocks, *F*, *F*; and finally the ropes, *G*, *G*. The wheel in Figure 1 is shod with the rubber pneumatic tire. The lever *D* rests upon the shaft of the wheel, so that when the rope *G* is pulled, the lever is brought down, and there is so much weight pressing upon the tire of the wheel. When a pressure equal to 120 pounds is brought down to bear upon the rubber tire, the tire sinks in at the bottom to the degree indicated by the arrow *H*.

Figure 2 illustrates the same kind of wheel treated in a parallel way as regards pressure. The tire on the wheel is of paper instead of rubber, and the result, as seen in the illustration, is that the weight does not cause the tire to sink in so much at *H* as in the rubber tire.

From this comparison, the conclusion is drawn that the rubber tire must prove more durable, and be less affected by friction and running over cobble stones, mud, etc. While the rubber tire, through the constant squeezing together, compression, and inflation, is liable to fracture, the paper tire, less yielding, is not subject to the wear and tear in the same degree.

The objection to this reasoning, as stated by the rubbermen, is that any diminution in the degree of the "sinking" of the tire is necessarily achieved at the expense of its elasticity, resiliency, and flexibility,—the very qualities which give the pneumatic tire its value and excellence, and on which speed depends. A steel tire will not sink at all,—as far as the human eye can see, at least,—and hence ought to be preferred to all flexible and yielding tires. But it is not, because resiliency is the very thing sought after. The projectors of the paper tire say that the ingredients which they mean to put into the paper stock will make it not only firm and durable so as to be water- and mud-proof, but elastic as well. Manifestly, however, they cannot make it as elastic as rubber, while resiliency seems to be out of the question altogether.

The composition of the paper tires is shown in Figures 3 and 4. In Figure 3 *B* represents the paper cover, *A* being the interior composition which consists of curled hair. In Figure 4, the interior composition of curled hair is likewise named *A* and the paper cover *B*.

The details of the process are withheld for the present. The method of drawing out a paper tube is old and well known to paper-manufacturers. The operation of uniting the two ends is new, but scarcely interesting to rubber-men. The hair used instead of interior linings and air is forced into the hollow of the tube before the union is made. To make the packing uniform, a special instrument is used.

As already hinted above, the rubber trade, while interested in this development, is indisposed to "take much stock" in the invention. Those who have been made acquainted with the facts so far made public do not believe there is much chance of success, but they are willing to be convinced and will await the practical test of the paper tire with interest. One thing, however seems clear, that, as was remarked by Mr. P. L. Gately of the New York Mechanical Rubber Co., the paper tire described is in no proper sense a pneumatic tire, as it has none of the true pneumatic features. It is really a kind of cushion tire, with the difference that the shoe or curve is to be of paper rather than of rubber. It is therefore misleading to compare it with the pneumatic rubber tire, either in respect of cost or any other. Even if should prove successful, and as good as, or even better than, a rubber cushion tire, it would not in any way be a rival of the rubber pneumatic tire.

Mr. G. R. Bidwell, of the New York Tire Co., said that while the tire above described is not a pneumatic tire, having no air-tube, the successful use of paper for the shoe or cover might lead to the use of paper for the covers of true pneumatic tires. The tire of his company is so constructed that the resiliency, speed, and elasticity do not at all depend on the cover, and any durable material could be used in making it. Mr. Bidwell said that he had himself been thinking of a substitute for rubber for the cover, but that nothing satisfactory had occurred him. If there is anything in this paper project, he would gladly look into it. On being asked why he thought at all about substituting some other material for rubber in making the shoe, Mr. Bidwell explained that at present all makers of tires, like the makers of bicycles, are trying to reduce the weight of the tire. Lightness is the cry everywhere, and tire-manufacturers recognize the necessity of doing everything possible to meet this demand. Now a rubber cover cannot be made thinner than at present without increasing liability to accident. But paper would weigh less than rubber, and hence lighter tires could be made if paper could be used instead of rubber for the shoe.

RUBBER- TIRE NOTES.

The Pneumatic Tire, says *Bicycling News*, is generally considered an invention of recent birth, and the application of the pneumatic principle to the wheels of vehicles other than cycles to be an even younger growth. But the patent records show that the pneumatic tire was the very first form of elastic tire ever invented. This was in 1845. The first solid rubber tire was not patented till the next year. An intense conservatism on the part of the makers and users of carriages seems to be indicated by the fact that they did not sooner see the advantages of pneumatic tires and solid rubber tires over the ordinary forms, which have been awaiting for their acceptance so long. They are now just inserting the thin end of the wedge, when they have seen the success of the resilient tire on the bicycle.

Yankee Tires Abroad.—According to the *Irish Cyclist*, the English tire business of the Gormully & Jeffery Manufacturing Co. (Chicago) during January, 1894, was four times as large as during the same month last year.

They all Had Rubber Tires.—Upward of 84,000 cycles were sent out from Birmingham, England, and 87,000 from Coventry, during 1893.

What the Rubber Tire Has Done.—One almost wonders, says *The Wheeler* (an English journal), what the bicycle trade would have been like if the pneumatic tire had not come along, for, as we gaze upon it now fully, one-half of the people who have anything to do with the trade are tire people first and cycle people afterwards. Tire, tire, tire is the talk everywhere. Companies have been formed for the manufacture and the supply of tires on a basis such as cycle firms themselves would indeed envy. The very making of the machine seems to be now subservient to the tire. One can scarcely realize the change which has taken place in four years, that the India-rubber band should have worked so marvelous a revolution, and that it should have been the means of developing and accelerating the progress of the sport. Its coming has meant the absorption of hundreds of new men into the trade, until one might say that at the present time the cycle trade is numerically about double what it was about four years ago.

The Care of Tires.—Mr. Fred. W. Morgan (of Morgan & Wright, Chicago) says that the durability of the bicycle is vastly increased by the use of pneumatic tires. In fact, the tire does all the work. The bearings of a good machine show practically no wear after a season's use. With cushion or solid tires it is very different. As for the care of tires, no oil, varnish, or other fad should be used to preserve the rubber. Water and dirt have no effect on rubber; let the rubber alone. No special care of any kind is necessary to preserve the rubber. Ride where and how you please; don't worry about your tires; don't ride out dreading a possible puncture; at same time, don't be a clam and scorch over fresh broken stone, broken glass, or tomato-cans. Eighty per cent. of punctures occur on paved streets. Country roads, where the stones are worn smooth by traffic, are safe for fast or slow riding. Pump the rear tire harder than the front; don't pump the tires as hard as you can get them, but hard enough to sustain your weight; pump the front tire so it will flatten same as rear when you are riding. A soft front tire saves the front forks of the wheel and takes off the jar on hands and wrists. If the tire does not hold the air, always test the valve-stem by holding it in water, to see if the leak can be located there. *Don't* screw the valve-cap down as tight as you can; don't use pliers or pipe tongs to screw with. Experience has shown that not one valve out of a thousand will leak when properly handled. If the rear tire shows much wear after a season's use, it is a good idea to change the tires front to rear, if wheels are the same size. Two-thirds of the weight and strain come on the rear tire.

George W. Speaight, India-rubber chemist, has removed from No. 150 Nassau street, New York, to the Downing building, Nos. 106–108 Fulton street.

BRIEF ABSTRACTS OF RECENT RUBBER PATENTS.

AMONG recent patents issued by the United States Patent Office, embodying applications of India-rubber or Gutta-percha to a greater or less extent, have been the following. It is not practicable here to do more than to note the use of rubber in each case, with sufficient detail to enable those who are interested to decide whether or not to look into any particular patent more fully:

TIRES.

No. 515,134.—Pneumatic Tire. David P. Sims, Lincoln, Neb.

A pneumatic tire consisting of a vulcanized rubber tube, having molded therein a protection strip made up of a metallic fabric composed of links or rings which interlock both longitudinally and laterally and a strip or strips of loosely woven textile fabric to which the metallic fabric is connected so that the links will be crowded together.

No. 515,284.—Pneumatic-Tire Repairer. Charles E. Buckbee, Flushing, Mich., assignor of two-thirds to Charles S. Wheeler and George Cronk, same place.

The method of repairing pneumatic tires which consists in inserting a tubular needle connected with a supply of rubber cement into the hole or fracture to be repaired, forcing sufficient of the cement through the needle to cover the inner surface of the tube about the point of fracture, and form a button thereon, and withdrawing the needle while the tire is inverted so that the cement will follow the needle and fill the puncture.

No. 515,392.—Vehicle-Wheel. Matthew C. Yarwood, Syracuse, N. Y.

A vehicle-tire composed of a tube, hollow spheres connected thereto and closely contiguous to each other, and means to exhaust the air from them and to fill them with compressed air when placed in alignment, a felly adapted to receive said tube, and means to compress said tube and disconnect said spheres from each other in combination.

No. 515,908.—Pneumatic Tire. John J. Fox, New York city.

The combination, with the rim of a wheel, of a tire comprising an inner or air tube and a flexible outer cover or protector having rigid bifurcated edge pieces fixed to its opposite edges for embracing the opposite edges of the rim, and means for removably securing the cover or protector to the rim.

No. 516,201.—Wheel-Tire. Emile Grenet, Paris, France.

A tire consisting of an outer casing of flexible material and a continuous coil of rubber spirally arranged within the casing.

No. 516,364.—Pneumatic Saddle for Cycles. John Carroll, Belfast, Ireland.

The combination, with a pneumatic saddle having an internal ventilating-tube arranged lengthwise therein, of a flange extending round the inner edge of the saddle cover, a supporting saddle-plate having a groove therein, and a frame having a bulb formed on it for securing the flange air-tight to said plate.

MECHANICAL GOODS.

No. 516,028.—Rubber Mold or Pattern and Process of Manufacturing Same. Michael Smith, Passiac, N. J.

The process of making rubber molds or patterns consisting in applying to a porous mold or pattern to be imitated a sheet of rubber, exhausting the air from said porous mold or patterns so as to cause the rubber to enter the design thereon, and then vulcanizing.

No. 516,029.—Apparatus for the Manufacture of Rubber Molds and Patterns. Michael Smith, Passaic, N. J.

In an apparatus for making rubber molds or patterns, the combination of a vulcanizing-chamber, a hollow platform having means of exhausting air therefrom and having its surface perforated, and a mold or pattern having suitable holes or pores to permit the escape of the air.

INSULATED WIRE.

No. 515,192.—Material for Insulating Electric Wires. Gustave A. Cannot, London, England.

An insulating covering for electric wires consisting of a coating first of bitumen, second of peat-fiber, third of spermaceti, fourth of tar, and fifth of peat-fiber.

DRUGGISTS' SUNDRIES.

No. 515,288.—Syringe. Charles D. Harsin, Stockton, Cal.

In a syringe, the combination of a tube, an elastic bulb surrounding the tube and connected therewith to receive from and discharge to the same, and a receiver surrounding the elastic bulb, but not communicating therewith, and having an opening in its nozzle through which fluid ejected from the tube may be drawn by suction, into said receiver, for the purpose described.

SURGICAL APPLIANCES.

No. 515,367.—Surgical Tourniquet. George L. B. Rounseville, Chicago, Ill.

In a tourniquet, a compress provided with a long, straight bearing-surface of convex contour transversely, with its respective ends rounded upward, and having a passage running lengthwise thereof, in combination with an elastic string or cord adapted to said passage in the compress.

MISCELLANEOUS.

No. 515,636.—Drip Attachment for Umbrellas. David W. Whitaker, Durham, N. C., assignor of three-fourths to Thomas E. Whitaker, Robert Rufus Bridgers, and Nellie F. Boone, same place.

The described drip attachment for umbrellas, comprising the fluted or corrugated funnel-shaped parts connected at their large ends and having top and bottom apertures, an elastic bottom annulus, a reinforcing ring, having inwardly projecting friction studs, and the top funnel.

No. 515,875.—Device for Floating Vessels over Bars. James Hadley and Festus Foster, Haven, Kan.

A device for floating vessels, etc., comprising a series of collapsible or inflatable bags, a heavy cord or rope netting surrounded and inclosing each of said bags, rings held in said netting, flexible connections attached to said rings and connecting said bags in pairs, and said pairs in series, air-pipes connecting said bags in series, and means on the bags at one end of the series for connection with an air supply.

TRADE-MARK.

No. 24,241.—Dress-Shield. Amolin Company, New York city. (Filed January 16, 1894.)

Essential feature, the word "Amolin." Used since January 1, 1893.

PATENTS EXPIRED.

No. 186,855.—Attaching Hose to Hose-Coupling. Edwin A. Leland, Brooklyn, N. Y., assignor to L. Richardson, same place. (Filed January 13, 1877.)

The combination, with a coupling-section constructed with tapering portions, as described, of the tapering binding-ring and the hose, the whole coöperating substantially as and for the purpose set forth.

No. 186,872.—Game Apparatus. W. Pitman and C. F. Jacobson, New York city. (Filed September 26, 1876.)

A game apparatus, consisting of a set of ten-pins made of solid rubber or other soft and elastic material, and balls made of similar material, whereby the noise in bowling is avoided, and the wear of the bowling-alley, the pins, and balls reduced.

No. 187,151.—Chain-Pump Buckets. Stephen F. Lockwood, Stamford, Conn., assignor of one-half his right to Elbert White, same place. (Filed January 10, 1877.)

A rubber disk having a beveled edge and a plain surface on one side, and an annular channel and a central boss on the other.

No. 187,397.—Air-Beds. John M. Macintosh, Finsbury, and William Boggett, Chelsea, England. (Filed December 27, 1876.)

A bed or cushion constructed of an air- or water-tight vessel or case and an exterior covering or envelope.

No. 187,568.—Harness-Saddle Pads. William Thompson, Matteawan, N. Y. (Filed August 7, 1876.)

A molded harness-pad, the body of which is sponged-rubber covered by a thin film or coating of vulcanized rubber.

No. 187,654.—Billiard-Table Cushion. J. E. Maynadier, Boston, Mass., assignor to H. W. Collender, New York city. (Filed January 11, 1877.)

A billiard-cushion composed of a rubber body molded with a depression or recess in its face, a face-hardening device resting in said depression, and a covering and retaining sheet or strip of rubber.

No. 187,655.—Billiard-Table Cushion. J. E. Maynadier, Boston, Mass., assignor to H. W. Collender, New York city. (Filed January 11, 1877.)

A billiard-cushion composed of a single piece of rubber having an extension or flap, a cavity or depression, and a face-hardening strip, secured in place by said flap.

No. 187,656.—Billiard-Table Cushion. J. E. Maynadier, Boston, Mass, assignor to H. W. Collender, New York city. (Filed January 11, 1877.)

Molding the rubber strip with a flap, or in form as shown in cross-section, to fold over onto itself and around a face-hardening strip.

No. 187,775.—Shoe-Tips. S. Prior, Trenton, N. J. (Filed January 15, 1877.)

A boot- or shoe-tip of leather or raw hide, provided with a base-plate or web of rubber secured to its flange.

No. 187,848.—Base-Balls. D. Hale, Boston, Mass. (Filed February 10, 1877.)

A base-ball provided with a sewed cover of India-rubber cloth.

No. 187,878.—Billiard-Tables. J. Marsden, Liverpool, England. (Filed December 8, 1876.)

A billiard-table for out-door use, consisting of the metal frame, provided with the slats or bars, and concrete bed, and metallic rail, adapted for use in connection with rubber or other highly elastic balls.

No. 188,232.—Harness-Pads. E. R. Cahoone, Newark, N. J. (Filed February 13, 1877.)

A pad for harness-saddles or coach-pads, composed of a base, parferably of vulcanized India-rubber, perforated, or other elastic material molded to fit the tree, and combined with a lining of felt.

No. 188,303.—Manufacture of India-rubber Hose and Tubing. J. Murphy, New York city. (Filed August 14, 1876.)

The process herein described for preventing mildew and decay in rubber hose, the same consisting in saturating or impregnating the fabric of which the hose is made with a preparation of copper free from corrosive acid or acids.

No. 188,307.—Trusses. Jacob A. Sherman, New York city. (Filed January 22, 1874.)

The truss-pad made of an inflated India-rubber bag, in combination with the secondary back, connected at its edges with the pad, and having a central opening, and the attaching-plate or stock introduced therein.

No. 188,446.—Flexible Tubing. H. Wakeman, New York city. (Filed August 15, 1876.)

The flexible tubing, composed of a flexible hose and a surrounding flexible resilient metallic armor, consisting of interlaced ranges of springs.

REISSUES.

No. 7,479.—Tube-Packing. S. L. Fox, Philadelphia, Pa., assignor to H. H. Doubleday. Patent No. 45,822, dated January 10, 1865. (Filed December 8, 1876.)

An oil-well packer, consisting of two rims or flanges, and a flexible or elastic packing material, arranged between the flanges and adapted to be compressed against the wall of the well, and also against the inner tube.

INDIA-RUBBER SCRAP.

THREADS have been cut from sheet rubber so fine that 7000 to 8000 yards would weigh only one pound. Such threads are utilized in the manufacture of suspender-webs and goring, also in Jacquard looms in place of webs, in some looms as many as 3000 of these threads being used.

* * *

A PAIR of rubber boots, whether Woonsockets or Colchesters does not appear, caused the separation of husband and wife recently. The woman, whose love for whisky exceeded her affection for her husband's rubber boots, pawned the latter to procure the wherewithal for purchasing the former, the alleged object being to celebrate Washington's birthday. The husband brought suit and a New York judge granted a decree of separation.—*Boots and Shoes Weekly.*

* * *

SPEAKING of the Colchester Rubber Co. reminds one that President Watkinson is now the assistant manager of the United States Rubber Co. A better selection could hardly be made, and the rubber manufacturers are a unit in so expressing themselves.

* * *

AN English newspaper asserts that thousands of barrels of rubber cement are used annually in the leather-shoe industry of that country, requiring the product of several factories. Among the great variety of consumers of rubber cement are the photographers, who use a small quantity for sticking purposes after it has been thinned to an unusual degree.

A LONDON house advertises rubber hose at the following prices per foot, which will prove interesting in the way of comparison:

	⅛ inch.	¼ inch.	½ inch.	1 inch.
No. 1.....	6*d*	7*d*	8*d*	11*d*
No. 2.....	8*d*	9*d*	10*d*	1/1
No. 3.....	9*d*	10*d*	1/1	1/4

No. 1 has one layer of canvas; No. 2 two, and so on. The hose is so made in lengths up to sixty feet.

EVOLUTION OF THE TIRE.

THIS will be the racing bicycle of the future if they keep on enlarging the tire.—*Judge.*

DENTISTS are now recommending that the best toothpick,—and the substitute is a misnomer,—is a thin piece of rubber passed between the teeth. There is not the slightest chance of any injury in the use of rubber, and there is in everything else at present used. Some ingenious person might devise a frame to make the operation less acrobatic for the jaw.

* * *

ON the evening of the recent dinner given in Providence by President Banigan to the sales-agents and officials of the United States Rubber Co., Mr. Paine planned to return to Boston. He therefore said good-bye and started for the ten o'clock o'clock train. A street-car accident delayed him just long enough to make him miss his train. Going over to the Narragansett he engaged a room and, knowing that his better half was expecting him tried to telephone to Cambridge. It was too late to do that and also too late to telegraph unless an expensive message went out from Boston. The next morning, however, he squared matters by wiring home, "I shall not return last night."

* * *

'T IS NOW the gay Italian woos
Ash-barrels for old overshoes,
To make the hard clams which beguile
The epicure at Coney Isle.

—*Puck.*

* * *

A CERTAIN rubber-mill in New England that is modern, progressive, and prosperous, was recently the theater of a real surprise. It seems that the superintendent of this mill prides himself upon the speed and economy with which his rubber compounds are mixed. To accomplish this he had the largest and most powerful mixing mills and not only kept abreast of what other rubber-factories were doing in this line, but was ahead of many of them. Judge of his surprise therefore when a new machine on trial in his factory did three times the work that the best of his mixers could do. "It is simple as possible," he acknowledged, "and it will work a revolution in every mixing room in the country. Are we going to install them? Our order is already in."

* * *

IT is not generally known that India-rubber is a substance that expands by cold. This was shown by Professor Dewar at a lecture recently. A piece of rubber tissue was stretched like the head of a drum and cooled locally by the application of a pad wetted with liquid air to minus 180° or so. Whenever touched by the cold pad the rubber expanded into puckers, which stretched tight as the rubber got warm again.—*New York Engineer.*

RUBBER IN THE LATEST SLANG.

DURING a recent discussion between a newspaper-man and State Senator Owens, of Brooklyn, on the merits of a third person, the senator said: "Why that man is no good. He's not even decent. The fellow wears rubbers."

The newspaper-man was at a loss to understand the senator's meaning, but, not wishing to appear behind in the slang of the day, said nothing. The next day he approached a well known politician and asked him about it.

"What does it mean when you speak of a man as wearing rubbers?"

"My boy," said the politician, "that is the very latest slang expression. It simply means that a man is a sneak; figuratively speaking, he approaches you with muffled feet. If you go into any police museum in the country one of the things they'll show you is the rubber shoe that the sneak-thief or the assassin uses. It is an ordinary tennis-shoe with a rubber sole and a canvas upper, and the only reason it is worn by crooks is because it gives them an opportunity to creep up behind their victim without being heard."—*New York Sun.*

THE MAGNOLIA METAL CO.'S SALES.

THE business of the Magnolia Metal Co., in the sales of "Magnolia" metal, they report, increased 12 per cent. from January, 1893, to January, 1894, notwithstanding one of the greatest periods of depression passed over the country during that time. The factory of this company was not closed for one day on account of the panic, and a part of the time it had to run all night in order to fill promptly the orders for the "Magnolia" metal. The outlook for the coming year is bright, and the Magnolia Metal Co. anticipate an increase of at least 50 per cent. over the business for 1893.

ACCORDING to a French electrical journal, it has been discovered that cells containing caoutchouc are contained in plants in which it has not before been found; among them are the *Wimmeria*, *Salacia*, and *Plagiopteron*.

1—FOR LAND.

2—FOR WATER.

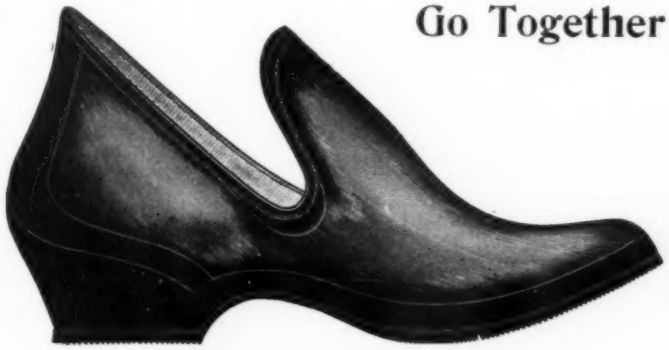
HUNKEY'S PATENT FLORIDA BICYCLE.

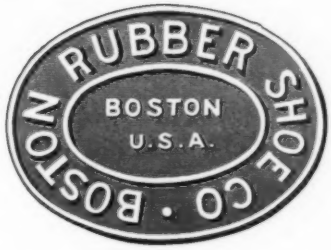
FROM "JUDGE."

A Good Name
For a Good Shoe.

These Two Always

Go Together





If they are Genuine.

NAME AND SHOE, STORM SLIPPER.
SHOE AND NAME, BOSTON RUBBER SHOE CO.

THE NAME 7,450,992 times on 3,725,496 pairs of

STORM SLIPPERS

Sold in Three Years.

BOSTON RUBBER SHOE COMPANY,

EXCLUSIVE MANUFACTURERS.

RECENT INDIA-RUBBER STATISTICS.

THE world's consumption of India-rubber has not yet been fully or accurately estimated, though the amounts can be stated with an approximation to correctness for the principal countries manufacturing rubber goods. The following table is based upon the latest available statistics, showing the amount (in pounds) of crude rubber used in each of the countries named during two years:

	1892.	1893.
United States and Canada (*a*)	32,958,000	35,583,000
Great Britain (*b*)	13,726,944	16,127,328
Germany (*c*)	8,249,780	8,881,840
France (*d*)	6,678,674	6,561,969
Austria-Hungary (*e*)	1,204,500	1,522,400
Italy (*f*)	611,040	739,200
Russia (*g*)	3,181,482	3,181,472
Total	66,610,410	72,597,209

NOTES.

(*a*) Deliveries to manufacturers, estimated by Earle Brothers.
(*b*) Total imports, minus exports for the same year.
(*c*) Net imports, including Gutta-percha.
(*d*) Deliveries for home consumption, officially declared, including Gutta-percha.
(*e*) Net imports.
(*f*) Total imports, estimated in part.
(*g*) This amount was exported from England to Russia in 1892, and the same figures are repeated in the estimate for 1893, it being presumed that all the imports by Russia were for home consumption.

No account is here taken of the consumption of India-rubber in Switzerland or Spain or other countries. These figures do not embrace any considerable amount of Gutta-percha except in the case of Germany, for which country it is impossible to separate the statistics of this commodity from those of India-rubber. Doubtless if the rubber consumed in other countries than those named in the table were added to the total there given, deducting at the same time for the Gutta-percha included in the figures for some countries, the correct total, for India-rubber alone, would be not far from 73,000,000 pounds.

The exports of rubber from Pará last year amounted to 42,086,435 pounds, which would leave a little less than 31,000,000 of the year's consumption to be supplied from other countries. The United States imported from other American ports than Pará 3,146,065 pounds, and it is probable that from the same ports enough rubber went to Europe to swell their product to 5,000,000 pounds. Deducting this from 31,000,000 pounds we have 26,000,000 pounds left for Africa and Asia to supply. Doubtless 23,000,000 pounds of this came from Africa, from which continent Great Britain alone has imported in one year as much as 8,000,000 pounds.

GERMANY.

THE importation by Germany of crude India-rubber and Gutta-percha for the year 1893, as officially reported, showed a large increase over 1892. There was also an increase in exports of crude gum. The figures express quantities in pounds:

	1892.	1893.
Imports	10,323,280	11,438,460
Exports	2,073,500	2,556,620
Net Imports	8,249,780	8,881,840

The exports and imports of manufactures of India-rubber are thus stated (in pounds) for the past year:

	Exports.	Imports.
Hard Rubber in Mass	34,320	5,500
Rubber Threads	273,240	522,280
Coarse Soft Rubber Goods	2,565,640	407,220
Fine Soft Rubber Goods	1,647,800	834,240
Finished Hard Rubber Goods	971,960	14,740
Rubber Toys	616,660	43,340
Tissues Woven with Rubber	757,680	335,720
Elastic Hosiery	40,260	10,120
Waterproofed Hempen Fabric	751,680	89,760
Compressed Rubber Cloth	.....	275,440
Unclassified Wares	6,820	.....
Total, 1893	7,166,060	2,538,360
Total, 1892	6,872,360	2,034,340

The larger items of increase in exports were in coarse soft rubber goods, rubber toys, and hempen tissues. Exports declined in hard rubber and manufactures thereof. Imports increased with respect to rubber threads and fine soft rubber goods.

PARA.

THE figures in the tables below have been compiled from monthly statements supplied to THE INDIA RUBBER WORLD by Messrs. Norton & Co. The first shows the amounts, in pounds, of arrivals at and shipments from Pará during the first two months of 1894:

MONTHS.	ARRIVALS.	SHIPMENTS.		
		United States.	Europe.	Total.
Stock	3,040,400			
January	5,214,000	2,445,400	2,723,600	5,269,000
February	5,907,000	4,371,400	1,742,400	6,113,800
Totals	14,151,400	6,916,800	4,466,000	11,382,800
Deliveries	11,382,800			
Stock	2,768,600			

Comparisons between the above months and the same months of 1893 may be made with the aid of the following table:

MONTHS.	ARRIVALS.	SHIPMENTS.		
		United States	Europe.	Total.
Stock	1,701,200			
January	3,300,000	2,202,200	1,386,000	3,588,200
February	6,600,000	2,620,200	748,000	3,368,200
Totals	11,607,200	4,822,400	2,134,000	6,956,400
Deliveries	6,956,400			
Stock	4,650,800			

COLOMBIAN RUBBER PRODUCTION.

THE latest available official figures of the production of crude India-rubber in Colombia, gained from the countries importing the same, are given herewith, representing pounds:

	1889.	1890.	1891.	1892.
United States	888,949	679,933	1,096,788	792,715
England	52,080	112,224	18,032	216,160
France	157,128	94,023	98,445	95,442
Germany	18,680	19,800	6,820	(*a*) 15,100
Total	1,116,837	905,980	1,220,085	1,116,427

[(*a*) Estimated by the Editor.]

These figures are for calendar years, except as to the United States, for which the fiscal twelve months are used, ending on June 30 in each year. The United States imports from Colombia for the year ending June 30, 1893, were 719,626 pounds. Analysis of the above figures shows average annual receipts for all countries from Colombia, during four years, of 1,089,820 pounds. Figures given in the United States special consular report on India-rubber, from Colombian custom-houses, indicated an annual average shipment for four years (1886-89), of 1,205,079 pounds.

UNITED STATES.

THE imports of crude India-rubber for some time past have shown a falling-off, as compared with a corresponding period one year ago. The figures herewith are furnished by the United States treasury department:

ARTICLES.	Month ending February 28.		Eight months ending February 28.	
	1893	1894	1893	1894
Imports:				
India-rubber..... lbs	5,491,756	3,573,199	27,270,111	22,746,073
Gutta-percha.....	50,823	82,191	393,152	295,799
Total.....	5,542,579	3,655,290	27,663,263	23,041,872
Exports:				
India-rubber..... lbs	10,246	89,175	395,211	1,344,336
Gutta-percha.....	.....	6,315	.....	8,589
Total.....	10,246	95,490	395,211	1,352,925
Net Imports:				
India-rubber..... lbs.	5,481,510	3,494,024	26,874,900	21,401,737
Gutta-percha.....	50,823	75,776	393,152	287,190
Total.....	5,532,333	3,569,800	27,268,052	21,114,547

The exports of rubber goods have also experienced a decrease. During February only 11,117 pairs of rubber shoes were exported, as against 28,908 pairs in February, 1893. The total value of rubber goods exported (including shoes) during the eight months ending February 28 was $908,191, whereas the exports for the corresponding period one year ago amounted to $1,061,359. The imports of rubber goods for eight months have amounted to $205,656 this year as against $217,572 last year.

STATISTICAL BREVITIES.

A BRITISH consular report on the trade of Zanzibar for the calendar year 1892 contains the following statement (based in part upon estimates) of the exports of crude India-rubber for the period under review. No account is taken of weights, but only the value in rupees:

To—	Value.
New York.....	Rs. 12,651
Boston.....	1,309
London.....	380,471
Hamburg.....	103,276
Bombay.....	8,700
Total (rupees).....	506,407
Total (sterling).....	£31,650

o

ALL statistics of commerce in Peru are meager and they are seldom up to date. The British consul at Guayaquil, reporting on the trade of that port, shows the following comparison of rubber exports:

YEAR.	Pounds.	Value.
1891.....	503,000	£25,150
1892.....	463,500	25,493

It is of interest to note that, of the exports for the latter year, 440,200 pounds, valued at £24,211, were consigned to the United States.

RUBBER SUPPLIES FOR THE GOVERNMENT.

AMONG the biggest contracts in the gift of the United States government is that which is made about this time every year, for military supplies. It is eagerly looked forward to by thousands of merchants and manufacturers all over the country, who are accustomed to enter bids for one or more of the lines. These bids are now being invited by the United States quartermaster's department, for deliveries to be made at Philadelphia and Jeffersonville, Ind. All proposals are required to be in by April 26. Among the supplies required are the following items, which will have a special interest for readers of THE INDIA RUBBER WORLD:

Five thousand pairs arctic overshoes. Fronts and quarters to be made of black tweed waterproof with scarlet fleece lining, held together by an inner coating of India-rubber. Vulcanized rubber foxing around the entire shoe, to rise at heel sufficiently to cover counter, to be about one inch deep at sides forward of heel, and to rise at toe to a height of about 1½ inches at center. Tap-sole and tap-heel of vulcanized rubber; bottoms rough; average height about 10 inches from heel to top of rubber at back; front and quarter joined by a gore of same material so as to exclude snow, water, etc. Fastenings at front to consist of two straps and two buckles, with rivet at each buckle and strap. Front and quarters secured by rivet at each side. Average weight about 3 pounds and 8 ounces per pair. (No. 9 shoe taken as the standard for weight and measurement.) The overshoes to conform in material, pattern, and workmanship to the standard sample.

One thousand rubber ponchos. To be 45×72 inches of 16×16 sheeting coated with rubber, dull finish. To have an opening 13 inches long, crosswise in the center, covered by a flap of same fabric as above described, 2½ inches wide, and finished with a button and button-hole in the center of the opening. To have sixteen brass grommets, ¼ inch inside diameter, inserted along the edges so as to show four at ends, and six at sides, as per standard sample. On one side and end the grommets to be inserted 2 inches from center to edge of poncho, and on the other side an end 1 inch from center to edge of poncho, which is to have a flat rubber ribbon, binding ½ inch wide all around. Each grommet to be reinforced with the rubber fabric 1½ inches square. Average weight of poncho to be 2 pounds and 7 ounces. Material, workmanship, and finish to conform to standard sample.

The annual contracts of the government printing office are about to be given out, and until May 7 the Hon. Frank W. Palmer will receive proposals for a wide range of articles, among which are the following items of rubber:

Davidson's velvet erasive rubber, No. 12.
Eagle rubber erasers, 12 to the pound.
Eagle ink- and pencil-erasers, small, medium, and large.
240 gross A. W. Faber's rubber bands, No. 33, ⅛ inch.
48 gross A. W. Faber's rubber bands, assorted sizes (Nos. 30, 31, 32 and 33, ⅛ inch, in each gross).
24 gross A. W. Faber's rubber bands, No. 0, ¼ inch.
24 gross A. W. Faber's rubber bands, No. 0, ½ inch.
36 gross A. W. Faber's rubber bands, No. 000, ¼ inch.
300 gross A. W. Faber's rubber bands, No. 17.
36 gross A. W. Faber's rubber bands, No. 10.
240 gross rubber bands, No. 33, ⅛ inch; sample required.
48 gross rubber bands, assorted sizes, Nos. 30, 31, 32, and 33, ⅛ inch, in each gross; sample required.
24 gross rubber bands, No. 0, ¼ inch; sample required.
24 gross rubber bands, No. 0, ½ inch; sample required.
36 gross rubber bands, No. 000, ¼ inch; sample required.
300 gross rubber bands, No. 17; sample required.
36 gross rubber bands, No. 10; sample required.

It will be well for all prospective bidders for the above business to remember that it is one of the requirements of the government that no proposal, where the amount exceeds $1000, will be considered, unless accompanied by a bond.

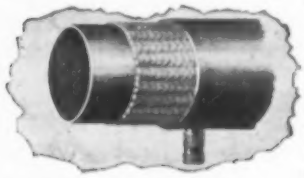
NEW GOODS AND SPECIALTIES.

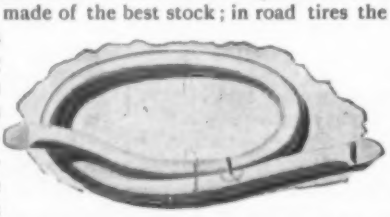
AN emery wheel that is said to be especially adapted for grinding saws, fine knives, cutlery, planing-knives, and fine tools, and also for polishing glass, enamel work, horn, etc., has just been brought out. Its special advantage seems to be in a porosity that is difficult to get in goods of this kind, and yet retain the strength shown in the solid wheel. So far this wheel has shown itself as strong as the strongest.

In addition to this it does not burn the tools, has a fine cutting surface, and does not clog up on the face. As it is of this free cutting nature it can be used on any grinding without a change of speed. This wheel is guaranteed to run perfectly at the high rate of speed usually employed for vulcanite wheels, or it may be run as slowly as the ordinary emery wheel, and still do the work. Manufactured by the Manhattan Rubber Manufacturing Co., No. 64 Cortlandt street, New York.

THE NEW YORK TIRE CO.'S PNEUMATIC TIRE.

IN point of construction, the tire herewith illustrated, like the high-grade bicycle, is interchangeable,—that is, any part can be renewed without renewing the whole. The tire is composed of three parts: first, the air-tube and valve; second, the constrictive fabric tube or restraining jacket, enveloping the air-tube; third, the cover or wearing shoe cemented to the fabric tube. Under the principle of this construction, the fabric is not subjected to the extreme heat necessary for vulcanization, which may destroy its strength and cause the tire to crack and burst. A vulcanized tire necessarily loses a good deal of the resiliency, while the solutioned tire remains soft, yielding, and resilient. The fabric used is designed, through its peculiar weave, to distribute all strains and thus prevent bursting. The air-tube is made of the best stock; in road tires the pierced-end form is used, while in racing tires the continuous form is used. The former is made seamless, owing to the liability of a leak at the seam. The methods of pinching the ends has been improved by a proper reinforcement of material. The air-tube is made self-sealing, not by the use of unvulcanized rubber, but by vulcanization in such a way that when an aperture made by any pointed object closes permanently and allows no air to escape. The valve used is that which has prevailed since the advent of pneumatic tires. It is attached to the air-tube by a rubber disk and stem, readily detached. The cover is the band of rubber lined with cotton duck "solutioned" to the fabric tube. It serves as a wearing shoe only, and is not intended to withstand any air pressure, in which respect this tire is unique and different from all others. This cover is not an integral part of the tire, and can be renewed if damaged beyond repair. Manufactured by the New York Tire Co., No. 97 Bank street, New York.





A PRESSURE-GAGE FOR TIRES.

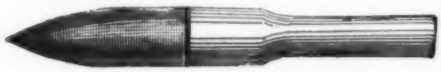
THE accompanying cut illustrates a pressure-gage manufactured by Schaefer & Budenberg, No. 66 John street, New York city. The gage is made to fit any valve. The diameter of the dial is one inch, and its weight does not exceed two ounces, so that it will not prove a cumbersome attachment to a bicycle. The object of this novelty is to enable the rider to inflate his tire to whatever pressure best suits him. It is stated that this invention has had a large sale in Europe.

SHERMAN'S HOSE-CLAMP.

THE construction of the hose-clamp manufactured by H. B. Sherman, Battle Creek, Mich., and illustrated in the accompanying engraving, is stamped in one piece from sheet brass. The strip that is cut out from the lower part of the band is turned up under the screw to give an even grip. The manufacturer claims that the band remains always tight upon the hose; that it will not rust; that it is strong; that it can be easily taken off, and that it is as cheap as a wire band. The clamp is so constructed as to be particularly strong in the ears, where strength is required, and very pliable in the band, where this feature is necessary. They are formed from heavy, finished sheet brass, by dies, and because of this every one is perfect. Being made of sheet brass and not of steel, they will not rust. They are made in all sizes from ⅛ inch to 2 inches.

RUBBER POINTER-TIPS.

The school-supply business in the last few years has grown wonderfully, and from time to time draws on the rubber business for novelties and specialties. One that is used in almost every school to-day that pretends to have modern appliances, is the rubber pointer-tip.



This is simply a molded rubber protector that goes over the end of a pointer, but entirely does away with the tapping and scratching that comes when restless or mischievous scholars are reciting at the blackboard. The tip is a simple thing and costs but a trifle. Those schools that are not supplied should write George F. King & Merrill, No. 20 Hawley street, Boston, Mass.

THE "PEERLESS" LADIES MACKINTOSH.

A very natty garment and one that increases in popularity from day to day is the "Peerless." It is a three-cape garment with sleeves, the cape being eight, twelve, and sixteen inches in length. The capes are made up with or without silk linings, the whole garment being silk-stitched. It is tight fitting and can be worn either with or without the capes. Made up from the new and fashionable cloths that are in the market this season, and with the light coating of rubber that the consumer now calls for, it is an elegant and serviceable garment. Manufactured by the Norfolk Rubber Co., Chauncey street, Boston, Mass.

RUBBER-COVERED WIRE.

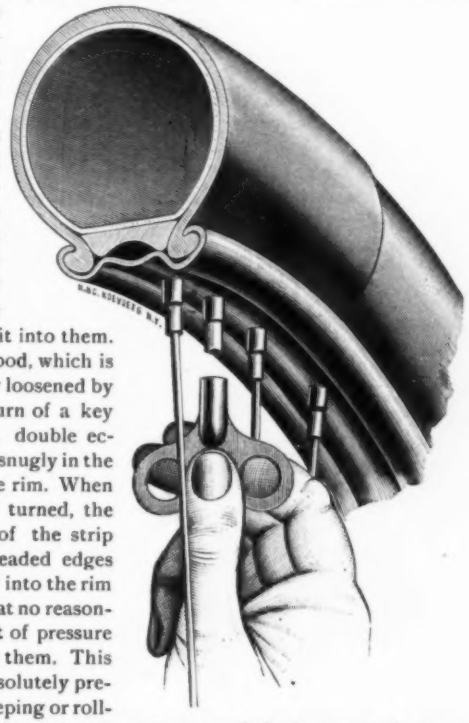
The General Electric Co. have just placed upon the market a new rubber-covered wire, for which superior qualities are claimed. This is known as the double rubber-core wire, and has three coverings. Next to the wire is an inner core of soft rubber, free from sulphur, and protected by a second heavy covering of pure vulcanized rubber. Over this is a braided sheath, finished with a weatherproof compound which serves to protect the rubber from the attacks of acids, alkalies, and from mechanical injury. Before applying the first covering the copper wire is thoroughly tinned to safeguard it from corrosion. The rubber coverings are made of the best grade of fine Pará rubber. The wire is made with three standard thicknesses of insulation, although it can be of any thickness desired. The lightest is intended for ordinary electric-light wiring and for use on circuits not exceeding 500 volts. The second is for use on circuits not exceeding 2000 volts, such as street-railway, primary-circuit-alternating, and arc-light circuits up to 40 lamps. The thickest insulation is for circuits up to 5000 volts, and is devised for high-tension work. Work with the last two insulations may be armored for any class of submarine work.

LIKE A DUCK'S FOOT.

For years past there have been many mechanical devices to assist in swimming. As a man makes the motions that a frog does in swimming, philosophers argue that with a few improvements he ought to be able to swim as fast, in proportion to his size of course. A step in this direction is the production of the swimming-glove here illustrated. This glove, to use a Hibernicism, makes the swimmer web-footed in the hands. It is made of pure gum, the bands at the backs fitting over the fingers and enabling the natator to make use of a powerful leverage during the last half of the swimming stroke. It ought to have a large and ready sale. Manufactured by C. J. Bailey, No. 22 Boylston street, Boston, Mass.

THE NEW YORK KEY TIRE.

The accompanying illustration represents the new tire, under the above name, which the New York Belting and Packing Co. have just placed on the market. They claim it to be remarkable for simplicity, lightness, and resiliency. The rim is of special construction. Its edges are rolled, and the beaded edges of the outer shoe fit into them. A strip of wood, which is tightened or loosened by the mere turn of a key operating a double eccentric, fits snugly in the center of the rim. When this key is turned, the tightening of the strip locks the beaded edges of the cover into the rim so closely that no reasonable amount of pressure can displace them. This is said to absolutely prevent any creeping or rolling; and as the entire circumference of the inner tube is above the rim, the whole of the tube is available for cushioning purposes. If the inner tube needs to be examined, the key is turned the other way, and the cover is detached. There is nothing to get out of order, the principle being simplicity itself. Manufactured by the New York Belting and Packing Co., Limited, No. 15 Park row.



THE BARTLETT CLINCHER TIRE.

This tire is said to have met with much favor in Europe. Among the merits claimed for it are secure attachment, ease of repair, great resiliency, and strength combined

with lightness. As the covers are put on without any tension, they are not as liable to cut as in the case of stretched tires. The tire, even if cut to the rim, will be held in place

by the beaded edge. The cover is made of the finest Pará rubber. The fabric used is of special quality and weave, which is manufactured exclusively for use in this tire. The valve is simple in construction. The tubes are endless, thereby giving a continuous circulation of air throughout the tube. This overcomes the defects of those tires in which butt-end tubes are used. Controlled by the Remington Arms Co., No. 315 Broadway, New York.

A THREE-CAPE MACKINTOSH SUIT.

THIS is in reality two separate garments. They are a shoulder wrap (consisting of three capes) and a skirt. Capes and skirts

are entirely separate and are made so purposely, for the reason that people often wish to wear capes without the rest of the garment, or throw aside a cape and still not go to the trouble of completely laying off the mackintosh. These garments are so made that with a small stock a dealer can fit almost any one. The skirt for instance has an adjustable waist band that will fit almost any waist, and the capes are so made that the long waisted or short waisted are easily fitted. These garments are made up in cotton single- or double-texture goods, the customer having a choice from about 150 patterns of the former and 100 of the latter all of which are late selections. The goods are lightly mackintoshed with a rubber compound that is guaranteed to stand any climate, and are known as the tropical odorless mackintoshes. Manufcatured by B. Birnbaum & Son, Limited, No. 47 East Twelfth street, New York.

THE "RIPPLE" LADIES' MACKINTOSH.

MANUFACTURERS of cloaks report that the ladies' mackintosh has effectually displaced the $10 or $12 cloaks that were so generally sold a few years ago. This is due to the fact, as much as anything else, that the makers of mackintoshes have studied the cloak styles so closely that they are able to equal them in all respects. The "Ripple" here shown is a garment that will be worn for a cloak as much as for a mackintosh. The special feature of it is the long full military cape crowned with three tiny shoulder capes. The graceful curves of these little capes suggested the effective name by which the garment was christened. All of these capes are silk-lined. The garment is sleeveless as are most of the better-style ladies' mackintoshes to-day. A point about the "Ripple" that will appeal to purchasers is its extreme lightness, which makes it the ideal spring and summer garment. Manufactured by the Clifton Manufacturing Co., Franklin street, Boston.

PARKER'S PNEUMATIC ANCHOR.

THIS is a novelty in the druggists'-sundries line. It is made of rubber, weighs but 75 grams, and is said to be capable of resisting 6½ pounds traction. When placed on a smooth surface it will raise a six-pound weight as shown in the illustration. It is designed to hold the suction end of a syringe-tube in position and may be applied to any bulb syringe. Manufactured by the Parker Pneumatic Anchor Co., Woodston, Kansas.

A POINT given a rubber-man by a young man in Alfred Hale's rubber-store, in Boston, may be of interest to the trade. It seems that customers invariably chose hose-bands, sprinklers, and pipes that were bright and clean, and yet in a rubber store brass goods soon grow dull and black. The young man to overcome this coated all of the goods with shellac, and as a result there are no more blackened pipes.

TRADE AND PERSONAL NOTES.

ANNOUNCEMENTS have been posted at the Millville and "Alice" mills of the Woonsocket Rubber Co. that work is to be resumed on April 16. It is expected that the works of the Lawrence Felting Co., which have been partially shut down for a few weeks, will resume in full about the same time.

—The stockholders of the New Brunswick Rubber Co. held their annual meeting on March 21, when the following directors were elected: Lewis T. Howell, R. G. Van Pelt, James P. Langdon, Mahlon C. Martin, Samuel P. Colt, Joseph Banigan, and James Deshler. The retiring directors were William H. Acken, Dr. Henry R. Baldwin, and P. A. Van Deventer, who declined reëlection.

—In the superior court at New Haven a temporary injunction has been granted on the application of the Rubber Reclaiming Co., restraining the Derby Rubber Co. from disposing of their stock in the former concern. The Derby Rubber Co. hold practically the controlling interest in the Rubber Reclaiming Co. The Reclaiming company claim that the Derby company are disposed to sell this stock to parties who would not be friendly to the other stockholders in the consolidated concern, hence the injunction.

—A new mechanical-rubber concern at Akron, Ohio, is called the Diamond Rubber Co. It was incorporated, under the laws of the state on March 26, with $50,000 capital. At a meeting of stockholders on March 27 Frank Reifsnider was elected president and manager; George F. Sherbondy, vice-president; Park B. Johnston, secretary and treasurer; and Walter Sherbondy, superintendent. The directorate embraces, in addition to these names, that of William Sherbondy. It is expected that their factory will be in operation by June 1 in the build- formerly occupied by the old strawboord company in East Akron. They will manufacture four different pneumatic tires, invented by members of the company, with the idea gradually of adding other mechanical goods to their output. Liberal offers were received from other towns where the location of the new plant was desired.

—The Consolidated Rubber Co., of Trenton, N. J., have commenced the manufacture of tires on a large scale. One of their special tires is the "Pease Detachable," which has been used by the Derby Cycle Co., of Chicago. They are also manufacturing a full line of cemented tires.

—The Peerless Rubber Manufacturing Co. (New York) report a brisk business. On May 1 the company will move into their new quarters, No. 16 Warren street—directly across the street from their old location—which are being fitted up at the expense of several thousand dollars. There will be steam heating, electric light, electric elevators, and every conceivable up-to-date improvement. "Come and see us next month," said Mr. C. H. Dale, the sales-agent of the company, "and you will find us installed in one of the finest offices in New York."

—The Goodyear Mechanical Rubber Co. are still in the hands of the receiver, Alfred R. Page. THE INDIA RUBBER WORLD is informed that things are in a fair way of being settled within a week or two, and that a reorganization will probably be effected that will place the firm on a sound financial and industrial basis. It is doing a fair business now.

—A. Straus, of New York, has purchased an interest in the Newton Rubber Works and becomes general manager. The factory will be superintended by Mr. Wayne, who was with Mr. Straus, as superintendent of the Goodyear Mechanical Rubber Co.

—The New York Tire Co., whose offices are now at No. 97 Bank street, will remove in a few days to No. 23 Warren street, the heart of the downtown business center. Mr. Bidwell says that the change will be in every way profitable for them. The company intend to pay special attention in their new quarters to the carriage-tire branch of their business, which requires a place open to inspection by the public, accessible, and convenient to business-men.

—Daniel M. Baldwin, a rubber-goods dealer at No 331 Main street, Hartford, Conn., has made an assignment in the probate court, and H. H. Francis has been appointed trustee of the estate. The schedules show liabilities of $14,820.99 and assets of $13,475.66. Among the creditors are the Boston Woven Hose and Rubber Co., $661.43; Hartford Rubber Works Co., $651.61; American Rubber Co., $2818.19; and the Gutta-Percha and Rubber Co., $1701.59. It is stated that the failure will not affect the new Middlesex Rubber Co., of which Mr. Baldwin is secretary and Mr. Francis president.

—The Easthampton (Mass.) Rubber Thread Co., on March 14, declared a dividend of 2 per cent.

—The stock and fixtures of the Worcester (Mass.) Rubber Co. have been purchased from the administrators of the estate of the late Aaron S. Taft by George W. Rousseau and Albert H. Bloss. Mr. Rousseau has been the manager of the company for some time.

—Henry E. Sanders, of Ironton, Ohio, has purchased the outfit of the Ironton Rubber Stamp Works and will continue the business.

—It is reported that the rubber-manufacturing business of the late John H. Tuttle, of Holyoke, Mass., whose death was announced in the last INDIA RUBBER WORLD, will be continued for the present by the estate, but that it will be offered for sale in the near future.

—The death is announced, at New Orleans, of Mr. Cerf Hirsch, of Cerf Hirsch & Co. It is stated that this will occasion no interruption in the business of that firm, which will be carried on as heretofore, in connection with Samuel Weil & Co., Bluefields, Musquito reservation, Nicaragua.

—T. W. Stemmler & Co., New York, have received invoices of new goods from the Mackintosh concern in Manchester, England. "We are ready to sell," says Mr. Stemmler, "and lots of customers would like to buy, but everybody is waiting till the tardy Congress does something with that tariff bill. I never saw anything like it," adds Mr. Stemmler. "Let them pass the bill, drop it, or do anything they like, but let them put a stop to this uncertainty."

—The firm of Reimers & Meyer, of New York and Boston, were inadvertently mentioned in this journal last month as "brokers," whereas, as everybody knows, they are an important rubber-importing house.

—Richard R. Whitehead, whose card appears on the first page of THE INDIA RUBBER WORLD, is in a position to market any sort of supplies among the manufacturers of Trenton, N. J. He already has a good trade among the rubber and pottery manufacturers, and is on the lookout for new ingredients or supplies for them and others.

—The Home Rubber Co. (Trenton) are putting in machines for the manufacture of garden-hose. The machines in question are made in East Boston by Webb & Watson.

—Manager Cook, of the Empire Rubber Co. (Trenton), says that hose sales for 1893 were especially satisfactory. He is expecting a larger trade this year, however.

—Wilson, Haight & Co. have opened a rubber-goods store at No. 207 Brady street, Davenport, Iowa, it being the first store of the kind in that city. Mr. Haight is described as having had several years' experience in the rubber-goods trade in other cities.

—At Erie, Pa., a building permit has been issued to the Erie Rubber Co. for a brick addition to their plant, to cost $1000.

—The Boston Rubber Shoe Co. will make a special lumberman's over for next season that will be adapted to go with any of the regular makes of wool boots. It will be sold at a price that will give it the same advantages that the "combination" offers.

—C. H. Dale, sales-agent for the Peerless Rubber Manufacturing Co. (New York), is preparing for his usual spring and summer visits to the various railroad conventions that will soon be held the country over.

—The Atlas Rubber Co. (New York) recently received a very fair order for some of Mattson's original syringes. This was the veritable syringe that was patented by Dr. Mattson, and was the first ever brought out in the United States. The patent ran out years ago, but it seems that its popularity has not expired with the termination of government protection.

—Superintendent Hoeftman, of the Washburn-Moen Insulated Wire Works (Worcester, Mass.), was for many years the practical man at the great Siemens cable-works in England.

—Henry F. Knowles (Boston), agent for the Globe Rubber Works, is having a first-class trade in lawn- and garden-hose.

—J. M. Plummer (Boston) has taken the agency of the Manhattan Rubber Manufacturing Co. for New England. He has office room at No. 113 Summer street.

—Professor Carmichael, of Boston, who is developing indurated fiber, is responsible for the statement that cuspidores, fire-pails, and articles of that kind, formerly made of rubber, are to-day made of wood-fiber, and are more and more being put on sale in rubber stores.

—C. J. Bailey (Boston), who is marketing a fine grade of toilet soap, explains that the action of poor soaps on rubber brushes was what first called his attention to soap-making. He found that a first-class soap not only did not injure rubber in the least, but was a most salable article when properly packed; hence his latest departure.

—The Norfolk Rubber Co. (Boston) now have an office in New York, at No. 335 Broadway. Mr. E. L. Hersey is their New York agent and is located at the above address.

—A charge of embezzlement has been made by the Day Rubber Co., of St. Louis, Mo., against Edward D. Williams, aged twenty-four, who was for four years, up to December last, a bookkeeper in their employ. The specific sum of $300 is named, though it is alleged that the shortage amounts to a great deal more.

—The Berlin Iron Bridge Co. (East Berlin, Conn.) have received orders for iron roofs for the new buildings of the New Jersey Zinc and Iron Co., at Newark (one being 60 × 187 feet); the iron work for the extension of the foundry-building of the E. W. Bliss Co., at Brooklyn, N. Y.; a new iron building (40 × 125 feet) for the Calumet and Hecla Mining Co.; an iron roof for the car-barn for the electric street-railway at Kingston, N. Y.; seventeen signal bridges for the Boston and Maine railroad; a 400-foot bridge across the Connecticut river at Stratford, N. H.; and numerous other iron bridges.

—The Gleason and Bailey Manufacturing Co. (Seneca Falls, N. Y.) are building a hose-carriage for South Amboy, N. J.; a hose-cart for Amityville, N. Y.; a fire-patrol wagon for Mobile, Ala; a steel truck for Tompkinsville, N. Y.; and a hose-wagon for Andover, Mass.

—Probably the only 100-foot vulcanizer in the country is in the possession of the Manhattan Rubber Manufacturing Co., in their Passaic factories. They are making hose now in 100-feet lengths, and use this vulcanizer in the curing.

—Suit has been brought against the Meyer Rubber Co. (Milltown, N. J.) by an employé named Vido, for $5000 damages, for the loss of a hand in the machinery, which he alleges to have been in a dangerous condition.

—The Hebrew Employés Benevolent Association, Setauket, L. I., which has been incorporated, is composed of operatives in the works of the Brookhaven Rubber Co., at Setauket. The particular business and object of the society is to extend aid to the poor and the sick.

—The Amazon Steam Navigation Co.'s steamer, *Rio Branco*, arrived recently at Manáos, from up the river, with 937,297 pounds of rubber, which is said to be the largest single cargo of rubber ever received at that port. The *Aripuana* arrived at Manáos about the same time from the Purús, having on board 534,600 pounds of rubber. The value of the two cargoes was estimated at $600,000.

INDIVIDUAL MENTION.

ON the morning of March 23 the Boston newspapers had a very interesting account of the feast of the Paschal Lamb by Boston Chapter of Rose Croix, Ancient and Accepted Scottish Rite Masonry, held at the United States Hotel in Boston. A prominent figure there was Sovereign Grand Commander Wheeler Cable, president of the Cable Rubber Co. The feature of the evening was the address of the sovereign grand commander, which is printed in full in the Boston papers. Most of the papers also published a picture of Mr. Cable, but, as is so often the case with newspaper portraits, it was far from presenting this well-known rubber-man as he looks.

—Mr. W. F. Jackson, the well-known rubber-man of *The Boot and Shoe Recorder*, like most newspaper-men, has a fad. Mr. Jackson's is music. He is a skillful flute-player, and he is a constant attendant at the Boston Symphony concerts.

—Mr. S. Theodore Hodgman, son of Mr. George F. Hodgman, president of the Hodgman Rubber Co., was married on Wednesday afternoon, March 29, to Miss Jeanne Fisk Park, daughter of Mrs. Edgar Park and grand-daughter of the late General Clinton B. Fisk, in the Madison-avenue Methodist Episcopal church, New York. Mrs. Park gave a large reception at her residence, No. 175 West Fifty-eighth street. Mr. Hodgman is actively connected with the Hodgman Rubber Co.

—Mr. W. B. Norton, of Norton & Co., who represent the New York Commercial Co. at Pará, sailed recently from that port on the *Amazonense*, on account of ill health, being accompanied by Mrs. Norton. They stopped in the Barbadoes, whence they expected to sail by steamer for New York and Boston, the latter city having been Mr. Norton's former home.

—Mr. J. Francis Hayward, of Boston, was a passenger on a train which was wrecked by a landslide on the Norfolk and Western railroad, near Buchanan, Va., last month, when the engine plunged over a precipice fifty feet high. Fortunately no passengers were injured, though their escape was a marvelously narrow one.

—Mr. George Ticknor Curtis, whose death in Boston was recently announced by the newspapers, was a contemporary of Daniel Webster and one of the prominent lawyers in the famous Goodyear rubber suit.

—Mr. J. H. Parker, manager of C. S. Knowles's rubber house (Boston), has been ordered by his physician to take a vacation from business, as his health is seriously impaired.

—Mr. Joseph Banigan was recently elected a director in the Chemical Rubber Co.

RUBBER SALESMEN.

Thomas C. Segerman is making his first trip for the Patapsco Rubber Co. (Baltimore), and is making a good start for a successful tour through Delaware and Maryland. Mr. Segerman has been in the rubber business for five years, and with the above company since it was incorporated.

—Harry Preiss, the well known representative of the Chesapeake Rubber Co. (Baltimore), is on his annual tour to the Pacific coast, where he has hosts of good friends among the buyers. Mr. Preiss met some of his old friends in St. Paul en route to Portland.

—Frank L. Mark, of Fryeburg, Me., formerly in the rubber business, and who is now running a hotel and chair-factory in his enterprising town, was in Boston last week and met some of his old friends who are still interested in rubber. Mr. Mark is well remembered in the trade in Portland, Boston, New York, and Baltimore. He was entertained with a supper and theater party by his friends during his short visit to the Hub.

—Gilbert Congdon, of the Cleveland Rubber Co., has just returned from an extended trip and is now at his home, awaiting his new fall samples of mackintoshes.

—The large road force of the Stephen Ballard Rubber Co. (New York) is busy throughout the country, booking orders for hose and belting, of which this well known New York house is a very large distributor. Their samples this spring are especially handsome.

TRADE PUBLICATIONS.

The Manhattan Rubber Manufacturing Co. (New York and Passaic, N. J.) have issued a neat 32-page catalogue and price-list of emery wheels, car-springs, rubber belting and hose, mats, packing, hose, tubing, and tires. Molded specialties enter largely into the business of this company, who are in a position not only to mold rubber goods, but also to supply molds. Besides the "Manhattan" and "Simplicity 47" pneumatic bicycle-tires, they offer to supply solid rubber tires for carriages.

—The rubber companies are not behind the times in calling to their aid the assistance of art in adding attractiveness to their trade publications. Rubber shoes are not usually considered as particularly ornamental, or as furnishing room for the employment of art, but this has not prevented the Boston Rubber Shoe Co. from introducing, on nearly every page of their Catalogue for 1894–95, in addition to a cut of one of their styles, a neat little colored picture indicating the use for that particular style. Thus for men's hip boots is shown a view of a man in a fishing-boat; another boot is shown on a farmer's boy; another on a lady out shopping on a rainy day, etc. It is understood that credit for this tasteful new departure in shoe-catalogue making is due to G. Louis Richards, of the company's Boston office.

—"Two Blades of Grass" is the lettering printed over a neatly lithographed picture of grass-blades on the cover of a "booklet" on garden-hose just issued for the spring trade by the New York Belting and Packing Co., Limited. The point is that the use of garden-hose makes two blades of grass grow where only one grew before, in consequence of which this use of rubber is much more important to gardeners than most of them have ever stopped to think. There are some useful hints to hose-dealers in this "booklet," besides descriptions of these grades of rubber garden-hose manufactured by the company, and also their cotton rubber-lined hose. Everybody interested is invited to ask for a copy.

—The Buffalo Wheel Co., manufacturers of Niagara cycles, whose agents in New York are the Commonwealth Rubber Co., have issued a handsome new catalogue, with a copy of which they favor The India Rubber World.

—The Boston Belting Co.'s garden-hose catalogue for 1894 embraces not only an extensive list of rubber and cotton hose, but also couplings, menders, reels, sprinklers, etc., in large variety.

CATALOGUES RECEIVED.

Simplex Electrical Co., Boston.=The Simplex Manual of Valuable Tables and Formulæ, Designed for the Use of Electrical Engineers. 60 p. [The company manufacture insulated wires and cables, involving the use of India-rubber.]

American Steam Packing Co., Boston.=[Catalogue of] Piston Packing and Mill and Railroad Supplies of All Kinds. 16 p. [Including the "Electric" Rubber-Back Spiral Packing.]

Indiana Rubber and Insulated Wire Co., Marion, Ind.=Second Price-List of Wires and Cables. 17 p. [With tables of weights and gages of wires. The "Paranite" insulating compound is a specialty with this company.]

Boston Woven Hose and Rubber Co., Boston.=The "N. G. L." Tire. 12 p. [Description, directions for use, and price-list.]

New York Belting and Packing Co., Limited, New York.=Turn the Key—We Do the Rest. 12 p. [Descriptions of the "New York Key" and other tires.]

Cable Rubber Co., Boston.=Price-List of Embossed Rubber Carriage Drill and Duck. 4 p. [With memorandum pad and calendar.]

Parker, Stearns & Sutton, New York.=Alpha and Omega Superior Rubber Specialties. 24 p.

Eastern Rubber Manufacturing Co., Trenton, N. J.=Catalogue of "Climax," "Gem," "Fleetwood," and "Cyclone" Tires, and other bicycle accessories. 32 p.

New Jersey Car Spring and Rubber Co., Jersey City.=Price-List of Vulcanized Rubber Goods. 84 p. [Liberally illustrated with designs of mats and other goods.]

RUBBER GOODS FOR THE POST-OFFICES.

THE postmaster-general will, until Monday, May 7, give manufacturers and dealers an opportunity to bid for supplying the post-office department with rubber bands and rubber stamps for the ensuing fiscal year. The following sizes of rubber bands are wanted, samples to accompany bids in all cases:

Rubber bands, best quality, in gross boxes, 1 gross each of Nos. 0¼, 00½, 000¼, 000¾, and 0000¼.

Two thousand three hundred gross, best quality, in gross boxes, as follows: 100 gross No. 11; 100 gross No. 14; 1000 gross No. 16; 100 gross No. 19; 1000 gross No. 31.

Rubber bands, best quality, in half-pound standard boxes (sides and ends of cover to extend to bottom of box) as follows: 600 pounds No. 11; 2600 pounds No. 14; 2000 pounds No. 16; 350 pounds No. 19; 750 pounds No. 31; 525 pounds No. 00¼; 400 pounds No. 00½; 625 pounds No. 000¼; 325 pounds No. 000¾; 150 pounds No. 0000¼; 350 pounds No. 0000½.

Manufacturers' label required to be placed on each box, and goods to be guaranteed to be of best quality.

The specifications for rubber stamps—which will be furnished by the postmaster-general on application—call for 11,310 dating-stamps, embodying a great variety, and the highest class of work. There are also wanted metal-bodied rubber type dates, and pallets; figures of various sizes; pads for various size pallets, one hundred and thirty-five dozen pads for rubber stamps, red and purple copying No. 2 and 3, 60 dozen No. 2, 2¾ × 4½ inches; 15 dozen No. 3, 3¼ × 6¼ inches.

The following goods are also desired: Three hundred pounds bevel erasers, best quality, twenty pieces to the pound; one hundred and fifty dozen combined pencil- and ink-erasers, in wood handles, twenty-five rubber stamping-pads, one-half inch thick, sizes from 8 × 10 inches to 20 × 30 inches, inclusive, as required.

Samples of all these goods will be required.

REVIEW OF THE RUBBER MARKET.

DURING the first three weeks of the month that has elapsed since our last review, prices continued to be very firm, in spite of a slow and dull market. The manufacturers did not do much buying, although a few exceptionally large sales were made by some importers and brokers. Generally speaking, the rubber-manufacturers are well supplied with crude rubber, although, as a prominent man in the trade observed, some of them doubtless exaggerate the amount of their stock in order to send prices down. Were the general business outlook brighter than it is, brisk buying would soon begin; but under prevailing conditions low prices seem to have no attraction for the buyers. Possibly they anticipate a still further decline in prices, but the brokers and importers of rubber say that everything has been done that can be done, and that prices will remain where they are, no matter how small the deliveries might be. The fluctuations have been within the range of one cent, and the fact seems to be that crude rubber will not be lower than 65 for fine and 45 for coarse. It is true that the prices for other commodities have suffered far more severely, and perhaps the rubber-manufacturers think that rubber "ought" to be lower for that reason, but the chances are that it will not be. It is true that the visible supply this month, as the figures below show, is greater than it has been in a long time, and if a dull summer causes an enormous accumulation of stocks, the strain will be exceptionally great, but it is to be borne in mind that the business depression in Europe, having commenced nearly three years earlier than ours, must soon come to an end. The symptoms of an industrial revival there are more numerous and unmistakable than with us. On the other hand, the demand for rubber in new applications is continually increasing, and the development of the electrical industry alone will put a heavy tax on the supply of rubber.

So far as the outlook for the immediate future in this country is concerned, while it is not to be denied that things are not as cheerful as one could wish, yet the feeling in the trade is an improvement must soon take place. The mechanical-goods people are running, and it is expected that the boot- and shoe-manufacturers will all be running before long. Some have already started up, and on April 17 the annual meeting of the United States Rubber Co. is to be held, at which the question of starting production in all of the concerns in the union will be decided. If the decision is in the affirmative, the market will be strengthened at once.

On the other hand, the policy of economy and retrenchment so vigorously pursued by the railroads at present affects the trade in lessening the demand for the rubber goods in use in that immense industry; and the same is true of the effect of the stoppage of mills on the demand for belting, packing, etc. But the best evidence of confidence is the stubborn refusal of prices to yield. Slowly mills are starting up, and the exhaustion of stocks of all kinds makes a business improvement almost inevitable. The cry on every side is for a speedy settlement of the tariff question by Congress. Unfortunately, politics stands in the way of a business-like disposition of the tariff, but it is hardly probable that the tactics discredited last summer in the Sherman-law discussion will be repeated now.

The arrivals of rubber since our last review have not been as large as they were during the preceding month. However, the *Amazonense* alone brought nearly a million pounds, and the *Origen* is afloat with a large cargo of rubber. During the month 35,000 pounds fine Pará and 30,000 pounds coarse Pará have been imported from Liverpool and other European ports.

The statistical position of Pará rubber in New York and elsewhere is as follows:

	Fine and medium.	Coarse.	Total.		Total 1893.
Stock, February 28, 1894....	987	112	1099	=	1394
Arrivals, March	695	271	966	=	893
Aggregating	1682	383	2065	=	2287
Deliveries, March.....	314	290	604	=	1178
Stock, March.....	1368	93	1461	=	1109

	1894.	1893.
Stock in England, March 31	870	555
Deliveries in England, March.....	430	395
Pará receipts, March.....	1830	2220
Stock in Pará, March.....	1165	1730
World's supply, March 31..... ... [Excluding caucho.]	5456	4764
Pará receipts, June-March ..... [Nine months of crop year.]	17,160	16,330

PRICES FOR MARCH.

	1894.		1893.		1892.	
	Fine.	Coarse.	Fine.	Coarse.	Fine.	Coarse.
First	66	47	76	53	67	47
Highest.....	66	47	76	53	72	52
Lowest.....	66	45	75	51	67	47
Last.....	66	45	76	51	71	50½

The latest quotations in the New York market are:

Pará, fine, new.....	65@66	Sierra Leone.....	20@31
Pará, fine, old.....	70@72	Benguela	45@46
Pará, coarse, new.....	45@49	Kongo Ball.....	38@39
Pará, coarse, old.....	none here	Camaroon Ball.....	35@36
Caucho (Peruvian) strip..	44½	Flake, Ord. and Lump....	26
Caucho (Peruvian) ball...	48	Accra Flake.....	14@15
Mangabeira, sheet.....	32@39	Liberian Flake	22@24
Esmeralda, sausage.....	47	Madagascar, pinky.....	55@60
Guayaquil, strip.....	27@35	Madagascar, black.....	38@43
Nicaragua, scrap....	43@44	Borneo.....	26@40
Nicaragua, sheet.....	41@42	Gutta-percha, fine grade..	1.30
Thimbles	36@37	Gutta-percha, medium...	1.00
Tongues..... ..	30@36	Gutta percha, hard white.	85

In regard to the financial situation Messrs. Simpson & Beers, brokers in crude India-rubber and commercial paper, report:

"The plethora of money continues; our city banks held on March 31 over $80,000,000 reserve in excess of legal requirements. Prime rubber paper is in meager supply, and we now name still lower rates, viz.: 3@3½ per cent. for first-class receivables, and 4½@5 per cent. for gilt-edge single-name notes, all three to six months to run. Tariff legislation retards spring business, and so continued ease in money is promised for many months."

WHY IS THE RUBBER MARKET FIRM?

A QUESTION on which there is considerable difference of opinion just now in the rubber trade is why and how is it that the price of Pará, fine and coarse, has been nearly stationary for a month, in spite of the extremely dull market and heavy stocks? Fine Pará has not gone lower than 65, and most sales have been at 66, while coarse has stood at 45 and refused to yield a single point. Now, from a theoretical point of view, considering the large accumulations of stocks, the record-breaking figures of the visible supply this month, and the poor demand for rubber on the part of the manufacturers, it would certainly seem that the price ought to decline. Yet it has not done so. Why? It is on this question that an interesting difference of opinion is disclosed in the trade. Some stoutly maintain that prices cannot decline, because they are now about as low as it is possible for them to go. The country they say, is rich and prosperous, and a temporary depression does not create a panic

among us. The American market is the best in the world, and the needs of the consumers will start up the wheels of production within a short time. Then buying will be very brisk, and lots of profitable business will be done. Why, then, sell at low prices now? It is this confidence and optimism that prevents importers and dealers from accepting prices they consider below the normal level. But, on the other hand, it is pointed out that it is evidence of a short memory to claim that prevailing prices are the lowest possible. The price of fine Pará has ranged from 38 cents a pound to $1.20 a pound. In 1876 people gladly sold fine Pará at 38 cents, while buyers were reluctant and declined to give large orders because they anticipated a still greater fall in prices; 38 cents was thought high! Yet this is a fact of record, as brokers know. In the eighties fine Pará sold at 51. Why, then, is it impossible for it to decline to-day to a point not far from those figures? The gentlemen who reason in this way affirm that the current quotations are artificially maintained, and that such a state of things cannot continue long.

"I should not be surprised," said one, "to see a marked decline within a few weeks. Of course a genuine boom in business would check and prevent it, but if business does not improve radically, there is nothing peculiarly sacred about rubber to protect it from the fate which has overtaken other staples. And my opinion is that it will fall."

Another gentleman advanced a very ingenious explanation of the phenomenon under consideration. "It may strike you as a paradox," he said, "but the fact is that prices are firm because nobody is willing to disturb them by a large order. People are buying from hand to mouth, a few tons at a time, and hence they neither expect nor obtain a lower price. This keeps the market firm. But just let some one offer to buy several hundred tons at once, and you will see a curious spectacle. People will be eagerly bidding for his order and tempting him with reductions, until the price will be found to have gone down seriously. What is true of one large sale, is still true of several such. A little vigorous buying would send down prices, because everybody is anxious to sell. And why should they not be? Is there a scarcity of rubber? Cannot one get all he wants? Yes, sir; the market is firm, because nobody is tempted to give it a shock."

In view of such wide differences of opinion, it would be hazardous to take sides, and hence the facts may be stated as a matter of interest simply. But the question why the market has remained firm under the most adverse conditions is still open.

AFRICAN RUBBER—LIVERPOOL.

To the Editor of The India Rubber World: Since our last report we have to advise a further decline in value of medium kinds. At the close the market is steady, with rather more disposition shown to buy. A fairly good day-to-day business has been done all through the month. The principal decline has been in the price of Liberian, which has fallen during the month from 1/0½ to 10½d. Soft pasty Liberian has fallen from 6¼ to 6¼d. To-day's quotations are as follows:

Soft Liberian	10½	@	11
Soft Liberian (pasty)	6	@	6¼
Hard Liberian		@	1/2
Accra, Saltpond, and Cape Coast Biscuits of fair quality	1/9 ½	@	1/10
Accra Biscuits best quality	1/10½	@	1/10¾
Addah Niggers		@	1/8½
Prime Selected Sierra Leone Niggers	1/5	@	1/6
Extra Prime " " "		@	1/9
Grand Bassam and Assinee	1/5	@	1/5½
Prime Gambia Niggers		@	2/2
Cameroon Clusters	1/5	@	1/6
Large Cameroon or Batanga Ball	1/4¾	@	1/5
Best Kongo Ball	1/8½	@	1/9
Gaboon Ball (or second Kongo Ball)		@	1/7
Thimbles	1/5½	@	1/6
Flake	1/–	@	1/0½
Lump Flake	1/0½	@	1/1
Prime Black Manoh Twists	2/2	@	2/3
Old Calabar	1/3	@	1/3½
Loanda Niggers	2/4	@	2/6
Benguela Niggers c. i. f. New York		@	1/9½

In the London market a fair business has also been done, and stocks of medium kinds there are light. Madagascar Niggers have been sold at 1/1½ @ 1/4½ according to quality; prime Mozambique Ball at 2/1½ @ 2/2; pinky Madagascar at 2/2½; Mattogrosso Negroheads at 1/9¼; and Mozambique Spindles at 1/4 @ 1/7, according to quality.

We append a statement of Liverpool rubber statistics for the month of March.

WM. SYMINGTON & CO.

Liverpool, April 4, 1894.

LIVERPOOL RUBBER STATISTICS.

	Pará grades.	Africans.
Stocks, February 28 (pounds)	2,190,720	1,471,680
Arrivals during March	647,360	1,064,000
	2,838,080	2,535,680
Stocks, March 31	1,523,200	1,865,920
Deliveries during March	1,314,880	669,760
As against deliveries during February	1,413,440	683,200

The stock of Pará rubber on March 31 consisted of:

	Fine.	Entrefine.	Negroheads.	Total.	
First hands	554	63	91	708	tons.
Second hands	110	5	10	125	"
Total	664	68	101	833	"

Stock of Ceará rubber on March 31, 436 bales; stock of Peruvian rubber, 5 tons.

IMPORTS FROM PARA.

The imports in detail of rubber direct from Pará at the port of New York, since our last report, have been as follows, all quantities being expressed in pounds:

March 29.—By the steamer *Etona*, from Pará:

	Fine.	Medium.	Coarse.	Caucho.	Totals.
G. Amsinck & Co.	21,800	6,400	7,800	. . .	36,000
New York Commercial Co.	17,100	1,100	12,100	.....	30,300
Total	38,900	7,500	19,900		66,300

April 1.—By the steamer *Amazonense*, from Pará:

Joseph Banigan	201,700	50,200	74,600	48,300	374,800
Reimers & Meyer	148,800	17,400	115,300	108,700	390,200
Lawrence Johnson & Co.	39,600	6,100	33,600	.....	79,300
Boston Rubber Shoe Co.	.....	.....	.....	46,700	46,700
Shipton Green	10,300	7,000	7,700	.....	22,000
Total	400,400	77,700	231,200	203,700	913,000

April 6.—By the steamer *Gregory*, from Pará and Manáos:

Joseph Banigan	112,100	29,800	34,200	12,000	188,100
Boston Rubber Shoe Co.	41,800	12,800	20,900	11,200	86,700
Lawrence Johnson & Co.	12,500	5,000	8,900	2,200	28,600
Reimers & Meyer	22,400	4,500	12,000	9,300	48,200
G. Amsinck & Co.	16,400	2,300	8,200	.....	26,900
O. G. Mayer & Co.	19,400	1,300	2,000	.....	22,700
New York Commercial Co.	10,400	1,100	4,800	. . .	16,300
Sears & Co	6,500	1,100	6,600	.....	14,500
Havermeyer & Brunn	6,400	400	2,600	.....	9,400
Shipton Green	3,600	600	4,700	.....	8,900
Order	1,100	1,900	200	2,300	5,500
George Cowl	3,300	400	1,000	.....	4,700
Herbst Bros.	700	.....	500	.....	1,200
For Export	2,600	400	1,100	.....	4,100
Total	259,200	61,600	107,700	37,000	465,800

March Imports from Pará	2,177,400
February Imports	2,309,102
January Imports	3,750,000
December Imports	3,226,200
November Imports	1,416,000
October Imports	1,661,600

IMPORTS OF CENTRALS.

BELOW will be found in detail the imports at New York, during March, 1894, of India-rubber from Mexico, Central America, and South America, other than Pará grades:

	POUNDS.
MARCH 3.—By the *Newport*=Colon and other ports:	
Piza, Nephews & Co.	5,355
J. M. Ceballos & Co	3,800
Bock & Co.	3,130
Hirzel, Feltman & Co.	2,806
To Order	3,600
W. R. Grace & Co.	1,900
A. Santos & Co.	700
Total	21,291
MARCH 4.—By the *Alene*=Cartagena:	
Pim, Forward & Co. (for London)	3,250
W. R. Grace & Co.	2,375
G. Amsinck & Co	2,125
W. R. Grace & Co	1,250
Total	9,000
MARCH 5.—By the *El Sol*=New Orleans:	
To Order	4,100
MARCH 5.—By the *Mexico*=Vera Cruz:	
J. Menendez	3,700
MARCH 7.—By the *Hudson*=New Orleans:	
To Order	5,800
MARCH 7.—By the *Concho*=Vera Cruz:	
T. Hermann	125
H. W. Peabody & Co	2,125
H. Marquardt & Co.	250
Graham, Hinkley & Co.	375
Total	2,875
MARCH 9.—By the *El Sud*=New Orleans:	
To Order	3,500
MARCH 12.—By the *Columbia*=Colon:	
G. Amsinck & Co	4,179
Piza, Nephews & Co.	4,160
Bock & Co.	2,190
To Order	2,593
Jacob Balz	1,649
R. T. Cornwell	1,567
Flint & Co.	1,391
J. Aparicio & Co	785
A. P. Strout	548
Gerardo Carton	330
Jas. McNider	370
T. J. Meyer	287
Lanman & Kemp	380
Total	20,387
MARCH 13.—By the *Knickerbocker*=New Orleans:	
A. N. Rotholz	300
MARCH 14.—By the *Saratoga*=Vera Cruz:	
Thebaud Brothers	450
Graham, Hinkley & Co	300
H. Marquardt & Co.	900
J. A. Medina	300
Samuel Brothers	150
H. A. Forrest	150
Total	2,250
MARCH 18.—By the *Carib*=Truxillo:	
Eggers & Heinlein	2,437
Hoadley & Co	303
Total	2,740
MARCH 18.—By the *Alba*=Cartagena:	
Ellinger Brothers	500
Hoadley & Co.	250
G. Amsinck & Co	125
Pim, Forwood & Co	4,000
Pinderford & Co	1,125
Total	6,000
MARCH 20.—By the *Louisiana*=New Orleans:	
Cerf Hirsch & Co.	8,000
Andreas & Co.	2,300
W. H. Crossman & Bros.	2,400
Earle Brothers	2,400
Total	15,100
MARCH 22.—By the *El Dorado*=New Orleans:	
To Order	3,100
MARCH 22.—By the *Yumuri*=Vera Cruz:	
Graham, Hinkley & Co.	600
H. A. Forrest	450
Thebaud Brothers	250
J. Agostini	125
Total	1,425
MARCH 23.—By the *City of Pará*=Colon and other ports:	
G. Amsinck & Co	23,632
Hirzel, Feltmann & Co.	7,113
Munoz & Esprella	8,166
Flint & Co.	5,000
J. M. Ceballos & Co.	572
A. Santos & Co.	5,923
New York Commercial Co.	11,265
J. Aparicio & Co	209
A. N. Capens Sons	1,750
Dumarest Brothers	940
C. Roldan & Van Sickel	1,388
W. R. Grace & Co.	2,800
Hoadley & Co.	1,540
Bock & Co	5,436
Total	73,732
MARCH 25.—By the *Mexico*=Vera Cruz:	
C. Viadero	1,625
MARCH 26.—By the *Athos*=Cartagena:	
A. N. Rotholz	625
MARCH 27.—By the *El Rio*=New Orleans:	
W. H. Crossman & Brothers	700
Betts & Robinson	3,800
Earle Brothers	7,700
Total	12,200
MARCH 27.—By the *Miranda*=Greytown:	
Eggers & Heinlein	5,300
G. Amsinck & Co	4,000
Andreas & Co	15,825
Munoz & Esprella	2,625
Hoadley & Co	1,750
Haynes & Bayly	675
Fabian & Mendy	195
A. P. Strout	1,375
Gerardo Canton	375
H. C. Potter	875
Total	33,125
MARCH 28.—By the *Yucatan*=Vera Cruz:	
Marquardt & Co	1,700
F. Probst & Co	125
Total	1,825
Total Imports of Centrals	224,500
Total for February	308,511
Total for January	214,247
Total for December, 1893	218,047
Total for November	251,676
Total for October	255,321
Total for September	143,364
Total for August	134,636
Total for July	263,526
Total for June	190,921
Total for May	257,483
Total for April	200,389
Total for March	277,450
Total for February	244,525
Total for January	222,308

IMPORTS OF AFRICANS.

THE figures below show in detail the imports of African rubber at New York during the month of March, 1894:

	POUNDS.
MARCH 5.—By the *Europe*:	
Windmuller & Roelker	38,267
MARCH 5.—By the *Aurania*:	
Reimers & Meyer	9,219
George A. Alden	18,934
MARCH 5.—By the *Berlin*:	
W. A. Brown & Co	5,713
George A. Alden & Co.	4,345
MARCH 5.—By the *Moravia*:	
Soltau & Co.	5,000
W. A. Brown & Co	6,241
H. H. Smythe	13,437
MARCH 5.—By the *Cevic*:	
H. H. Smythe	1,400
MARCH 10.—By the *Ludgate Hill*:	
George A. Alden & Co.	55,000
Reimers & Meyer	20,000
MARCH 10.—By the *Lennox*:	
Reimers & Meyer	10,000
MARCH 10.—By the *Lucania*:	
Reimers & Meyer	24,780
MARCH 10.—By the *Chester*:	
W. A. Brown & Co.	4,668
MARCH 10.—By the *Belgenland*:	
George A. Alden & Co.	4 800
MARCH 19.—By the *Umbria*:	
George A. Alden & Co.	12,000
MARCH 19.—By the *Majestic*:	
George A. Alden & Co.	24,000
MARCH 24.—By the *Vega*:	
George A. Alden & Co.	138,811
Perry, Ryers & Co	45,623
Reimers & Co.	11,287
MARCH 24.—By the *Campania*:	
George A. Alden & Co.	22,490
Reimers & Meyer	22,732
MARCH 24.—By the *Chester*:	
W. A. Brown & Co.	10,945
MARCH 24.—By the *Rhaetia*:	
O. G. Mayer & Co.	5,272
MARCH 24.—By the *Scandia*:	
W. A. Brown & Co.	5,500
Reimers & Meyer	6,827
MARCH 31.—By the *Germanic*:	
W. A. Brown & Co.	6,955
MARCH 31—By the *Etruria*:	
Reimers & Meyer	22,400
MARCH 31.—By the *Gellert*:	
W. A. Brown & Co.	3,514
Reimers & Meyer	9,782
MARCH 31.—By the *Teutonic*:	
George A. Alden & Co.	34,295
MARCH 31.—By the *La Touraine*:	
H. H. Smythe (substitute)	10,000
Total for New York	624,327

BOSTON ARRIVALS.

	POUNDS.
MARCH 1.—By the *Kansas*:	
Reimers & Meyer, Africans	14,000
MARCH 1.—By the *Durham City*:	
George A. Alden & Co., Africans	4,800
MARCH 2.—By the *Bostonian*:	
George A. Alden & Co., Africans	17,900
MARCH 7.—By the *Cephalonia*:	
George A. Alden & Co., Africans	4,000
MARCH 12.—By the *Ottoman*:	
Reimers & Meyer, Africans	19,000
George A. Alden & Co., Africans	4,000
MARCH 12.—By the *Michigan*:	
George A. Alden & Co., Coarse Pará	8,400
MARCH 16.—By the *Columbian*:	
George A. Alden & Co., Africans	17,600
United States Rubber Co., Africans	20,000
MARCH 21.—By the *Catalonia*:	
George A. Alden & Co., Africans	950
Total Pará	8,400
Total Africans	102,850
Grand Total	111,250
Total Boston Imports, February	154,140
Total for January	58,600
Total for December	368,364
Total for November	78,078

NEW ORLEANS.

	POUNDS.	VALUE.
FEBRUARY.		
From Nicaragua	88,326	$22,446
From Colombia	586	207
Total	88,912	$22,653
MARCH.		
From Nicaragua	65,868	$22,213

GOULD COMMERCIAL CO.'S STATISTICS.

IMPORTS FOR MARCH (BY TONS).

GRADES.	New York.	Boston.	Total.
Parás	1,520	4	1,524
Centrals	124	6	130
Africans	72	60	132
East Indian	..	..	..
Totals	1,716	70	1,786